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DIESEL RAILWAY TRACTION SUPPLEMENT

The July issue of THE RAILWAY GAZETTE Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price 1s.

DISPATCH OF THE "RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and machinery for such dispatch, and any reader desirous of arranging for copies to be delivered to an agent or correspondent overseas should place the order with us together with the necessary delivery instructions.

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas, as they are stopped under the provisions of Statutory Rules & Orders No. 1190 of 1940, and No. 359 of 1941

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:—

Mondays to Fridays - 9.30 a.m. till 5.0 p.m.

The office is closed on Saturdays

An Interview with Lord Leathers

LORD LEATHERS, in an exclusive interview recently with the Editor of THE RAILWAY GAZETTE, cleared up doubts on several important points relating to the railway industry. Obviously he could not be expected to explain his views in detail on the financial agreement between the railways and the Government, but he did make it clear that a new agreement is being negotiated to take the place of the original arrangement, and that discussions are now in progress between the Ministry and the railway Chairmen. Lord Leathers also confirmed that the country's coal problem is no longer one of transport, and that it is now possible to carry promptly every ton of coal the miners raise. He also hinted at a further move in the co-ordination of wartime transport, and expressed the view that in that respect there can be no finality. He was able to give a welcomed assurance that in most cases there has been a steady and progressive improvement recently in the turn-round of tramp ships in port. The interview with Lord Leathers is reported on page 13, as well as a message to the railway industry in which the Minister expresses his appreciation of the achievements of railwaymen in meeting the difficulties arising from the war, and the important part they are playing in the present struggle. He appeals to them to continue working out ways of keeping munitions and traffic on the move, and declares that every man who is in a position to save one hour in a wagon's journey helps to shorten the war.

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Transport Finance Corporations

Accounts for the year 1940 have been published of the Railway Finance Corporation Limited and the London Electric Finance Corporation Limited. These corporations were formed in 1935 by arrangement with the Treasury to provide a means of raising capital for transport developments, with the assistance of Government credit, on terms much more favourable than the main-line railways and London Transport could have obtained on their own credit alone. The rate of interest payable by the undertakings concerned on the capital so raised is estimated at 2½ per cent. Main-line schemes in contemplation involved an estimated expenditure of £26,500,000, and the Railway Finance Corporation made an issue early in 1936 of £27,000,000 of 2½ per cent. guaranteed debenture stock, redeemable 1951-52, at 97 per cent., which was fully subscribed. Loans to the railway companies stand in the corporation's balance sheet at £26,189,999. The London Electric programme contemplated an expenditure of £40,000,000 covering, *inter alia*, the electrification of certain suburban lines of the L.N.E.R. in North-East and North London, the construction and electrification of two additional G.W.R. tracks from North Acton to Ruislip, and the Finchley Road—Bakerloo tube. Loans by the London Electric Finance Corporation to "transport undertakers" have increased from £28,924,543 at the end of 1939 to £35,218,191 at the end of 1940.

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The London of the Future

There will be a wide measure of agreement with the premise that, in the London of the future, railway and tube facilities will need to be drastically replanned. Mr. George Dow, Information Agent of the L.N.E.R., who has made a study of London traffic problems, recently contributed an article to *The Star* in which he visualises some of the improvements which might and could be effected. Pre-supposing the electrification of all the lines, he made a good case for reducing the terminals of the main-line railways, by combination, to three, four, or five to deal with provincial and long distance trains, but urged that the error of perpetuating any of them for suburban working should be avoided. Our suburban railway terminals should be on the outer zone of greater London, not on the fringes of the central area, and the tube lines would link the various new main-line stations. Mr. Dow would have his main-line terminals formed by Paddington; a North station formed by amalgamating King's Cross, St. Pancras, and Euston; an East station formed by Liverpool Street and Broad Street; a

South station (Waterloo and Charing Cross); and finally Victoria. The Southern electric system radiating from Waterloo would be linked with the L.M.S.R. electric lines at Broad Street and the proposed electric lines of the L.N.E.R. at Liverpool Street by means of an extended and enlarged Waterloo & City tube. The effect of this would be to give the traveller from Staines to Broxbourne or from Shenfield to Guildford a fast journey with not more than one simple change.

* * *

U.S.A. Coal Strike Affects the Railways

The recent coal strike in the United States, which began on April 1 and lasted until the end of the month, resulted in the complete closing down of bituminous coal mines in the Upper Appalachian North and South fields and the partial closure in the Western fields, and affected American railways in two ways. The stoppage of production was naturally reflected in serious falls in coal traffic and revenues, and on a number of eastern railways made it necessary to eat into stocks of fuel. Western railways were in a more favourable position both as to traffic and fuel supplies. Railways such as the Maine Central and the Bangor & Aroostook which are some five or six days' journey from the source of supply felt the coal shortage severely. The incidence of the strike was not confined to the cessation of output for the full month, but was made greater because pit production was at a low level for at least a week before the strike started, and many orders were unfilled. Certain of the lines put into effect measures to conserve fuel, including the temporary suspension of some local branch-line passenger trains. Some railways which normally use a mixture of bituminous and anthracite coal increased the proportion of the latter. The New York, Ontario & Western by April 25 had but ten days' fuel supply in hand, and used 60 per cent. anthracite (stove) in hand-fired locomotives and 50 per cent. (nut) in stoker-fired engines. The latter are not designed to use a slow-burning anthracite and it became necessary to stop large freight locomotives about every 50 miles and dump fires completely.

* * *

Escalators

One of the problems connected with passenger transport by underground railway in large cities is that of meeting the necessity in rush hours of clearing the platforms during the interval of but 50 or 60 seconds between train arrivals. For this reason, as well as for that of adding to the popularity of underground travel by easing the labour of stair climbing from low level platforms to the surface, escalators are an essential feature of all modern underground railways. In the Pennsylvania station, New York, Otis escalators are provided to carry incoming passengers from the platforms to the lower concourse level, and also from the lower to the upper concourse and thence to the main entrance corridor. Numbers of stations on the Independent City Subway in New York were originally equipped with one escalator, which, although reversible, normally travelled continuously in the up direction. In several cases, however, provision was made in the escalator tunnel for the installation of an additional escalator when traffic demands should require it. Before these stations had been in use for many months, neighbourhood associations and civic bodies demanded that the additional escalators be installed at once so as to provide down as well as up service, and to have two escalators available for up traffic during rush hours in order to clear the platforms expeditiously. Two of the escalators in the Lexington Avenue-Third Avenue station of the Independent Subway have a rise of 56 ft. 3 in., the greatest rise of any escalators in service in the United States, but exceeded by some 30 ft. in the case of certain escalators in the London underground system.

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Co-operative Traffic Working

Competitive speculation was responsible in the past for producing some railway routes which, viewed from the standpoint of a unified transport system, would certainly never have been built. Further, the location of many com-

petitive lines was dictated by geographical features, and in the West of England Dartmoor is largely responsible for the peculiarity that down trains of the Great Western Railway and up trains of the Southern Railway travel through Exeter (St. David's) station in the same direction. Between there and Plymouth the two lines skirt the opposite sides of the moor, and they cross one another's tracks for the second time at Plymouth. In other words, down trains of both railways pass through Exeter and Plymouth in opposite directions. Physical situations like these naturally provide opportunities for interchange of traffic between the two companies, and so afford alternative routes, which in peacetime have often been used when one or other line has temporarily been blocked by accident or for the purpose of carrying out track repairs. In wartime such alternatives are even more valuable, and if refutation were ever needed of the accusation of failure to co-operate, the answer could readily be provided by showing how alternative routes have been many times immediately placed by one company at the disposal of another when emergency required it.

* * *

Stopping Main Line Trains before the Terminus

Many years ago it was usual to stop up main-line expresses to London at some convenient suburban station to enable passengers whose destinations lay on that particular side of the Metropolis to reach them more readily than *via* the terminus. With the development of improved London transport arrangements, brought about by electrification and tube extensions, the advantage of this arrangement gradually became in most cases insufficient to justify the delay to the majority of passengers who wished to alight at the terminus. With the coming of air raids to London last autumn, however, stops at suburban and outer suburban stations became advantageous for an altogether different reason. The class of stops introduced fell into two main categories. The L.N.E.R. and the G.W.R., whose suburban lines are not electrified, find that to stop any large number of their main-line trains regularly at the obvious interchange points of Finsbury Park and Ealing Broadway respectively, does not justify the delay, extra track occupation, and inconvenience to the majority of passengers which would be involved. During periods of air raid alerts, however, up evening expresses are stopped at these useful interchange points. The L.M.S.R. and the Southern Railway, on whose principal main lines electric suburban services extend considerable distances out into the country, now regularly stop main-line trains at Watford and Woking respectively, points considerably further out than the only suitable interchange places on the other two main lines mentioned, and of convenience to a considerably larger proportion of passengers travelling.

* * *

Progressive Signal Engineering in New Zealand

The technical development of signalling in New Zealand, although not involving such extensive works as have been required in other countries, has been for some time marked by a very progressive spirit, under the guidance of Mr. G. W. Wyles, the Signal and Electrical Engineer. This was fully brought out in a paper by Mr. Wyles reported in our issue of January 28, 1938, page 169. Ordinary power interlocking, single-line automatic signalling, C.T.C., and automatic and relay interlocking, are all represented in the Dominion, often embodying certain novel features called for by local conditions. On page 11 we publish a brief account of the special working, brought into use in July, 1938, on the Wellington-Johnsonville suburban line, which is single, and until the improvements of a few years ago was part of the main route to the north. In normal circumstances the signalling, crossing and terminal working, even train dividing at the intermediate stations, are effected without any signal staff being required on the ground, an excellent example of modern signal circuit design. The arrangements made to prevent any possibility of premature point operation, and for cancelling movements, are most complete and very flexible operation has been obtained.

The Locomotive Fuel Problem in Argentina

It is reported that railway stocks of coal in Argentina are now very low, and that with traffic receipts continuing to fall and operating costs rising, the position is becoming increasingly serious. Normally, between £4,000,000 and £5,000,000 worth of British coal is purchased annually, and this source of supply is now practically cut off. Also, because Argentina's trade balance with the United States is so one-sided that no exchange is available, American coal is virtually unobtainable. More and more wood fuel is being used, but, even where it is readily obtainable, its bulk and low calorific value make it unsatisfactory even for goods train working, and for main-line passenger services, it is ruled out unless schedules are greatly increased. Fuel oil is difficult to obtain, and the conversion of locomotives for its use is both costly and tardy because of scarcity of materials. On the other hand, there is a vast surplus of maize in the country, which cannot be exported and for which normal uses cannot be found, and it is not, therefore, surprising that every effort is being made to find a suitable way of burning it—by itself or mixed with coal—in locomotive fireboxes, as described at page 18 of this issue.

* * *

A Locomotive Screen Wiper Development

We have previously referred to the subject of windscreen wipers for use on locomotives, and the matter has now acquired topical interest as a consequence of orders recently placed by three of the main-line railways for new types adaptable not only to steam locomotives but also to diesel-driven railcars and electric rolling stock. Those responsible for the control of trains in bad, or even moderately bad, weather are aware that, under modern operating conditions a good outlook from the driver's cab is highly desirable. The circumstances may not be entirely analogous to those pertaining to road vehicles, where an unobscured view ahead on most occasions represents the only safeguard against serious mishaps; they are, however, sufficiently needful to warrant a closer investigation of their adaptability to railway purposes, and the fact that they are now being ordered by important railway companies, seems to indicate that this opinion is shared by those responsible. The practice of fitting small, hinged flaps on the outside of the cab is a good one, but it entails the driver having to put his head out of the side window when using them and devices which effect a clear outlook by keeping the front spectacle glasses clear, without this being necessary, would seem to be of greater advantage. The attention of our readers is directed to the article on page 18 of this issue, in which are described two new forms of screen wipers that have recently come on to the market.

* * *

Railway Coaches in Old Age

Discussing the varying fates of old railway carriages a writer in the *G. W. R. Magazine* mentions the use of one by a literary-minded Londoner, elderly and set in his ways, who had no thought of leaving London until one night his house was bombed. He now resides in an old railway coach close to a tiny village miles from the Metropolis. "I used to say, with Dr. Johnson," he remarked, "'When you have seen one green field, you have seen all green fields.' Now I know better, and prefer to say, with Joanna Baillie, 'This pure air braces the listless nerves, and warms the blood; I feel a freedom here.'" Lest it be thought that his praise was for the countryside rather than his wartime abode, he hastened to add, "Mind you, if I had found accommodation in the village, instead of adapting the old coach to my needs, I do not think rustic life, for all its charm, would have made the same appeal. When I feel like a chat, I can go to the 'local.' When I don't, I remain at home with pipe and book, and have no fear of being disturbed. In a billet, there would have been nothing for it but to listen to the gossip of the village every evening, and I should have been bored to tears." The writer adds a cautionary note that this kind of wartime accommodation is not now available to anything like the extent of the demand.

The Centenary of Cook's

THIS week the world-wide travel organisation of Thomas Cook & Son Ltd. attains its centenary, and under happier conditions than those prevailing at the present time the event would doubtless have been celebrated worthily. In wartime many of the normal activities of the firm are naturally curtailed drastically, but notable services to the community are still being rendered, and some of these are of a kind that will have to await the conclusion of hostilities for detailed description. The original Thomas Cook was born at Melbourne in Derbyshire on November 22, 1808, and was thus nearly seventeen when the Stockton & Darlington Railway was opened. His early days were in no way associated with travel, and as the son of humble parents he began his working life as a gardener's boy, and later set up in business as a wood-turner after serving an apprenticeship to his uncle in that craft. He became an ardent temperance worker and it was in connection with a large temperance meeting that he chartered a special train to assist those wishing to attend. This journey, which took place on July 5, 1841, is often described as the first public railway excursion, but actually there had been earlier trips at special fares, and the present firm of Thomas Cook & Son Ltd. wisely and accurately describes the event which was the beginning of the business as "the first public railway excursion organised by a private individual." On that July day a hundred years ago 570 persons travelled from Leicester to Loughborough and back at a shilling each for the double journey, 24 miles in all; Thomas Cook went with them and acted as conductor. Four years after this little excursion, the success of which brought an increased demand for similar trips, Cook ran his first tour, which included visits to North Wales, the Isle of Man, and Ireland. He compiled a small guide containing articles on places of interest on the journey, and this was the forerunner of the attractive handbooks now normally issued by the firm for tours in all parts of the world.

The business thus modestly inaugurated progressed rapidly and in 1851, the year of the Great Exhibition in London, Cook's Travel Agency brought no fewer than 165,000 visitors to the exhibition from all parts of the British Isles. Later Manchester and Dublin followed the lead given by London and organised exhibitions, and here again Thomas Cook took a prominent part in conveying the visitors. The Paris Exhibition in 1855 caused Cook to turn his attention to France and the Continent generally, and in the next year he inaugurated those circular tours which marked the beginning of the European tourist system. At first the Continental tours were confined to parties personally conducted by Thomas Cook, but in course of time the coupon system was inaugurated and this developed eventually into the well-known "international travel tickets." In 1870, at the time of the Franco-Prussian War, Cook was called upon to assist in conveying relief to the starving citizens of Paris at a time when the trains were under the control of the German military authorities. In the same year his only son, John Mason Cook, was appointed by the Khedive to act as Agent of the Egyptian Government for passenger traffic on the Nile, and when the British Government organised its expedition to Khartoum in 1884 for the relief of General Gordon, Cook was given the contract to transport about 18,000 troops and 130,000 tons of stores and war materials up the Nile.

Leicester continued to be the headquarters of the firm until 1865 when Thomas Cook opened an office at 98, Fleet Street, London, and placed J. M. Cook in charge of it. In 1872 a large building was erected in Ludgate Circus to serve as a central office and from that time onwards branch offices were opened in quick succession in leading cities and holiday centres, not only in the British Isles but throughout the world. Despite many additions made from time to time, the Ludgate Circus premises eventually became inadequate and in 1925 a portion of the site of Devonshire House, with a frontage to Berkeley Street, was secured for the erection of new central offices. A building of six floors above ground level was constructed and was opened on April 12, 1926; the booking hall alone occupies one-third of an acre. Three generations of the Cook family have been associated with the growth of the business. Thomas Cook practically retired from active work in 1878 and died in 1892 in his 84th year.

J. M. Cook died in 1899 and the direction of the business continued in the hands of his sons until 1924. On June 12 of that year a private limited company called Thomas Cook & Son Ltd. was formed to take over a large part of the old firm's business. At the same time a separate limited company was formed to control the undertakings of the banking department, under the name of Thomas Cook & Son (Bankers) Ltd. Mr. F. H. Cook, one of the grandsons of the founder, was appointed Chairman of both companies and continued to hold that position until June, 1929, when he retired.

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The Collett Influence

FOR more reasons than one, the retirement of Mr. C. B. Collett from the post of Chief Mechanical Engineer of the Great Western Railway in the same year that the death of Sir Nigel Gresley terminated his tenure of the similar office on the London & North Eastern Railway is a notable coincidence. In the course of 104 years, the G.W.R. has had but five chiefs at Swindon—Gooch, Armstrong, Dean, Churchward, and Collett—while in 90 years the L.N.E.R. and its predecessors, the Great Northern, has had four—Sturrock, Stirling, Ivatt, and Gresley—so that in each instance the average holding of office has exceeded twenty years, and the advantages so secured by continuity of policy in design have been both obvious and considerable. Evidence of this continuity was seen in the first express passenger designs produced by both these eminent engineers—the Gresley Pacific of 1922, which was in effect a six-coupled development of the Ivatt large-boilered Atlantic design of 1902, and the Collett 4-6-0 "Castle" of 1923, which continued in enlarged form all the leading features that Churchward, before his retirement, had carried as far as his "Star" class engines. It was the exhibition of the L.N.E.R. *Flying Scotsman* alongside the G.W.R. *Caerphilly Castle* at Wembley in 1924, and the G.W.R. claim, justified on a tractive effort basis, to have in the "Castle" the most powerful express locomotive in the country, that brought Collett and Gresley into close contact. For this claim evoked the L.N.E.R. challenge that resulted in the historic exchange of that company's Pacific engine *Victor Wild* for the G.W.R. *Pendennis Castle* in 1925.

Twenty-two years before that date, Swindon had developed the use of 225 lb. working pressure, while 180 lb. or so had remained standard elsewhere, and long valve-travels, permitting the engines to be worked economically at short cut-offs with their regulators full open; and this exchange amply proved the soundness of Swindon design. For the 80-ton Collett locomotive beat the 92-ton Doncaster product on the latter's own ground, keeping time without difficulty, and burning 3.7 lb. per mile less than its 4-6-2 rival, just as on the Paddington-Plymouth runs the "Castle" consumption of Welsh coal was 6 lb. per mile less than that of the Pacific. One of the most notable features of the work of *Pendennis Castle* on L.N.E.R. metals was the way in which the engine lifted trains varying in weight from 445 to 480 tons up the 1 in 105 incline from King's Cross, passing Finsbury Park, 2.5 miles, in times of 5 min. 42 sec. to a maximum of 5 min. 57 sec. throughout the test week—all most exceptional as compared with contemporary L.N.E.R. performance. In the following year, *Launceston Castle* went over to the L.M.S.R. for further comparative trials, and here the success of the Collett design was even more marked. Although none of the dynamometer car or coal consumption figures on these later tests were ever made public, it is generally understood that the power output of the engine in proportion to coal burned was the highest that had been recorded up to that time on L.M.S.R. metals, and such net times as 154½ min. for the 141.0 miles from Crewe to Carlisle, and 157 min. coming south, as compared with booked times of 165 and 176 min. respectively, showed that with 415-ton trains the "Castle" was far more than master of the L.M.S.R. schedules then operative.

The lessons of these trials were not to be ignored, and Mr. Collett, with the previous work of Churchward as the foundation on which he had built so well, could probably claim that his "Castle" design ultimately exercised a wider influence on British locomotive practice in general than any other individual locomotive type. At the same time, it is

no discredit to Swindon to remark that an exchange with the present-day products of Doncaster and Crewe could barely be expected to have the same results as those of 1925 and 1926. For while the G.W.R. has found the "Castles" of 1923 and the Collett "Kings" of 1927 adequate to meet its traffic needs up to the present time, the steady development of L.N.E.R. design, up to the Gresley "A4" streamlined Pacifics of 1935, and the similar steady evolution at Crewe towards the double chimney Stanier Pacifics of the "Duchess" and "City" series, have produced locomotive types which, on the showing of their most outstanding performances, would be extremely formidable rivals in any comparative trials of the future, with the applied lessons of later research incorporated in their design. Even so, however, the rivals might find it difficult greatly to improve on the thermal efficiency figures set up by *Caldicot Castle* on the trials of 1924, when consumption of 2.10 lb. of coal and 2.09 lb. of water per i.h.p. hr., and 2.83 lb. of coal and 28.1 lb. of water per drawbar h.p. hr., were recorded.

Unlike other British railways, the Great Western Railway has always kept locomotive running under the control of the Chief Mechanical Engineer rather than organising it as a separate department or merging it with the Operating Department. So far from this having had any adverse effect on G.W.R. speed, however, this company may well claim, with the wholehearted co-operation of its Locomotive Department, to have taken a lead in British speed up to the time that high-speed streamline services were introduced on other lines in 1935 and 1937. That Mr. Collett bore his full share in the development of G.W.R. speed propaganda is borne out by the notable performance of his engine *Tregenna Castle* on June 6, 1932, in working the Cheltenham Flyer over the 77.3 miles from Swindon to Paddington in 56 min. 47 sec., at 81.7 m.p.h., which still remains the highest average speed from start to stop yet achieved in Great Britain; with its 195-ton train, the "Castle" maintained an average of 87.5 m.p.h. for 70 miles on end, with a cut-off throughout of only 17.18 per cent. The return of *Manorbier Castle* with a 205-ton train to Swindon on the same afternoon in 1 sec. over the hour, against the gradually rising tendency of the road, with cut-off advanced to no more than 19 to 21 per cent., was a feat but little less remarkable. After the Bristolian had come into operation in 1935, with its 67.6 m.p.h. schedule, it was not long before this flyer was turned over from "King" to "Castle" haulage the latter engines proving quite adequate for the task, despite the 236-mile round trip to be performed in the day at this speed. Thus it is that the "Castle" class locomotives, now numbering over 120 may be regarded as Mr. Collett's *chef d'oeuvre*, and it is by them that his régime at Swindon will be best remembered.

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Iraq State Railways

THE latest report on the Iraq State Railways, recently received from the Director-General, Mr. G. N. Loggin, covers the 12 months ended March 31, 1939. At that date the open mileage of the system consisted of four main sections: Maqil (Basra) to Baghdad (West), 353 miles (metre gauge); Baghdad (North) to Kirkuk, 200 miles (metre gauge); Baghdad (West) to Baiji, 132 miles (4 ft. 8½ in. gauge); and 53 miles of the 198-mile Baiji-Mosul-Tel Kotchek (4 ft. 8½ in. gauge) extension, making, with 67 miles of branch lines, a total of 810 miles. The north and west stations at Baghdad are connected by a wagon ferry across the Tigris, but sanction has been given by the Government for a permanent railway bridge to take the place of this ferry, and the survey of the bridge and its approaches has been completed.

The upward trend of trade noted in 1937-38 was not sustained during 1938-39 and there was less movement of general merchandise throughout the country. The grain crop was good but due to conditions in the world markets less tonnage was carried. In regard to road competition the steps taken in the previous year have in many directions resulted in competitive transport being largely driven off the road, particularly on the left bank lines. Reduced rates for indigenous goods remained in operation throughout the twelve months. Passenger traffic, which showed an increase of 8,787 dinars in receipts, was stimulated by special bookings

on the occasion of the marriage of the Crown Prince of Iran, and there was also a steady growth in ordinary traffic. In goods tonnage there was a decrease of 49,463 tons due mainly to lesser movement of grain and dates and oils and a falling off in the import of sugar, iron, and timber. The table compares certain operating figures for the past two financial years (the Iraq dinar is nominally equivalent to £1) :—

	1937-38	1938-39
Length of line open, km.	1,211	1,304
Passengers	2,293,037	2,324,624
Passenger-kilometres	251,365,959	249,160,630
Revenue earning goods, tons	703,604	654,141
Goods, ton kilometres	277,624,723	240,600,499
Train-kilometres	2,695,379	2,717,016
Operating ratio, per cent.	85.9	81.1
Coaching receipts	202,449	216,153
Goods receipts	457,127	432,701
Total earnings	710,920	733,613
Total expenditure	663,587	753,063
Net earnings	47,333	Dr. 19,450

In the total earnings are included catering receipts from the Mosul rest house and from dining cars. The operating ratio above-stated is that between railway earnings and railway operating expenses (including minor works, but exclusive of renewals, replacements and betterments, and loan service). An average of 57 metre-gauge (including 4 sentinels) and 10 standard-gauge locomotives a month was in commission.

On the last day of the year covered by this report the section between Tel Kotchek and Mosul was opened, and on January 8, 1940, the section between Baiji and Qayarah was brought into use. The remaining section between Qayarah and Mosul was placed in service on June 17, 1940. By this new rail link (Baghdad-Mosul-Tel Kotchek) Baghdad became directly connected with Syrian and Turkish railways, which in turn are connected with railway systems in Europe. Further figures now available since the publication of the report for 1938-39 show that freight traffic on the Iraq State Railways decreased from 126,507,723 ton-miles for the first eight months of 1939 to 85,095,090 ton-miles for a comparable period in 1940. This does not, however, give a true picture of the traffic situation in 1940 inasmuch as the 8 months include less than 2 months operation of the new through route, which accounted for a considerable amount of transit traffic during the latter part of the year. This transit traffic was far the best for many years. Until recently, Iraq's transit trade was composed mainly of goods passing through Iraq to and from Iran, mostly through the Persian Gulf. Now, the port of Basrah has direct rail communication with Europe, but with a break of gauge at Baghdad.

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Railway Financial Agreement and War Damage

RECENTLY the belief has grown that a statement is impending on the progress of negotiations for the revision of the financial agreement between the railways and the Government, and also the scheme of war damage insurance which is to apply to the railway industry. The long silence on both these matters has had the effect of restricting interest in home railway securities and the market for some long time has been torpid. At this season in more normal times the home railway market would be enlivened by the attentions of those who had formed opinions as to the impending earnings and dividend statements which are due on July 25. Of the impending announcements by the companies the general impression is that dividends of a year ago are likely to be repeated. On the one hand it is appreciated that in the intervening twelve months there has been a very heavy increase of costs of operation, but on the other hand the companies have had the advantage of advancing traffics and also of the fact that in the first six months of this year the general level of charges has been 16½ per cent. above that ruling at the outbreak of war, whereas a year ago no increase of charges had been made up to May 1 when 10 per cent. was added.

The position of the railways in relation to the financial agreement has never been very satisfactory, but at the moment it would seem to be distinctly unsatisfactory. For 1940, the first full year for which the agreement had operated, the financial results could by no means be regarded as a true

reflection either of the work performed by the railways, or of the effect of the agreement which the Government had induced the railway companies to accept, as it has proved to be impracticable to implement one of the main provisions of that agreement. This provision, and one upon which the Government had insisted, was that the lines should be self-supporting and this was to be achieved by the speedy adjustment of charges to meet any increase in costs arising from the war. The last increase in charges was put into effect on December 1, 1940, and that was based upon the level of costs which had been estimated some months previously; to the extent by which charges had lagged behind costs, at the end of the year railway stockholders were at a disadvantage in comparison with the terms that had been accorded by the Government for the control of the lines. Since then their position—again strictly in relation to the terms which were offered them and which were accepted on their behalf by the companies—has steadily deteriorated by reason of the failure on the part of the Government to implement an agreement of its own making. It might, indeed, appear that the dangers foreseen by the Chairman of the main-line railways and voiced by them at their annual meetings in the early part of 1940 as to the practical and political difficulties of implementing the agreement have been recognised as insurmountable by the Government.

It has been known for some time that the financial agreement is to be subject to revision. The necessity for that arose from the decision of the Government to make the railways subject to a general scheme for war damage compensation, and therefore to delete from the agreement the clause under which the railways were to be permitted to charge as a working expense the first £10,000,000 of war damage in any one year. That revision was to take place from the end of 1940, and it is reasonable to assume, therefore, that whatever new agreement is negotiated is to be effective from January 1 of the present year. With nearly half the year gone, no authoritative indication has yet been given either as to the scope of the revision which is contemplated or of the lines on which that revision is taking place. The recent announcement by the Chancellor of the Exchequer on the broad outlines of the war damage scheme under which railways and other public utilities will come, however, suggests that the revision of the financial agreement itself must be drastic. In place of charging £10,000,000 a year of war damage to expenditure, apparently the railways are to be called upon to bear themselves up to 50 per cent. of the cost of making good all war damage. If this should prove to be so when the negotiations, which are at present taking place on various aspects of the war damage scheme, have been concluded it would seem that the railways must, in equity, be accorded substantial compensation in some other direction for this potentially very substantial deterioration of their position.

On the general point of the agreement and the right of the railways to increase charges, the Chancellor of the Exchequer has announced that in certain circumstances he may be prepared to subsidise in order to minimise the impact of higher transport costs on industry. Whatever may be done in this way, two considerations must remain; the first, of course, relates to the substantial time lag which had already occurred up to the end of 1940 when the old agreement was still operative. The second relates to the future. If railway charges are to be left at their present levels for the duration of the war, and if at the same time costs continue to increase, what is to be the position under a series of subsidies if, on the cessation of hostilities, the railways are decontrolled and passed back to their proprietors? It may well be, of course, that control will continue for a sufficiently long period after the war to allow for a fall in operating costs near to what might be called the normal; on the other hand, if the railways were to be handed back at a time when costs were still greatly inflated it might well be necessary for the railway companies to seek the authority of the Railway Rates Tribunal for a sudden and considerable increase in their charges as was the case after the last war. That would immediately place them at a serious disadvantage in their relations both with the public and with their competitors. The possibilities of such a course are sufficiently grave to call for the most careful planning.

Publications Received

Westinghouse Metal Rectifiers for Telecommunication.—This, the fourth edition of the Westinghouse Brake & Signal Company's Descriptive Pamphlet No. 11H, is in line with its predecessors for the excellence of its printing and the interest of its contents, which describe, with many circuit diagrams and photographs, a remarkable variety of uses to which the metal rectifier may be put in telegraphy, tele-

phony and wireless communication, not only in connection with power supply, but also in the circuits directly associated with the signalling apparatus itself, where the device is serviceable in a great variety of ways in promoting efficiency and economy. The principles involved in each instance are briefly set forth.

Static Phase Conversion (Westinghouse System).—This publication is the second edition of the Westinghouse Brake & Signal Company's De-

scriptive Pamphlet No. 11M, and describes the company's patented system of producing a three-phase supply from single-phase mains by static apparatus, the principles of which are explained with the aid of simple diagrams and graphs and a photograph of a typical set of equipment operating a cinema arc. The applications to lift and industrial motors and to telephone battery power supply are of some interest to railway engineers. The booklet is excellently produced.

THE SCRAP HEAP

The distinction of being the first railway station to run its own "war weapons week" is claimed by Stanton Gate (Notts). This L.M.S.R. station, which aimed at obtaining £100, raised £217.

* * *

REWARD

Paddington station office staff on No. 1 platform received flowers and chocolates with an anonymous note: "To the ladies at this counter who, for so long, have with the greatest possible patience and graciousness answered my questions, put up with my ignorance and helped me on my way."—From "The Evening News."

* * *

HE WAS VERY GOOD: HE SAYS SO
Lt.-Colonel Moore-Brabazon, Minister of Aircraft Production, said recently at a luncheon in London: "I was a very good Minister of Transport. I am not pretending you have got to be very good to be a good Minister of Transport. But I was translated to my present Ministry, and the plans we concocted at the Ministry of Transport remain in that Ministry. Whether they will ever see the light of day I do not know."

* * *

William F. Cody, famous Western scout and Indian fighter, earned his picturesque nickname of "Buffalo Bill" as a result of his contract to supply buffalo meat to the construction forces building the first trans-continental railroad (in the U.S.A.).—From "The Mutual Magazine."

* * *

"Where are some good places to stop on this trip?" asked the tourist.

"Well," drawled the farmer, "I reckon I'd stop at all railroad crossings."—From "The Mutual Magazine."

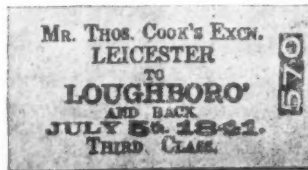
* * *

STANDARD TIME IN THE U.S.A.

At the stroke of 12 o'clock noon, on November 18, 1883, more than 50 different "times" were abolished in the United States, and railway clocks and watches throughout the country were set to Standard Time, or four standards of time (Eastern, Central, Mountain and Pacific, each one hour

apart). Standard time, which soon came into general use, was sponsored and put into effect by the General Time Convention of Railway Managers, which later became the American Railway Association and then the Association of American Railroads.

* * *



The earliest excursion ticket issued by Thomas Cook (see editorial article on page 3)

* * *

L.N.W.R. DINING SALOONS

We reproduce herewith an interesting item from the collection of Mr. H. W. Bardsley, Honorary Librarian of the Railway Club, showing the poster of the L.N.W.R. to mark the introduction of second and third class dining saloons into service between London and Birmingham, Liverpool, and Manchester, on September 1, 1897. The vehicles used were 50-ft. side corridor coaches, fitted with tables, and would be regarded as very cramped and uncomfortable according to modern standards. It was not until many months later that the 65-ft. second and third class vehicles appeared.

Dining cars (first class only) were first placed in service on the L.N.W.R. on March 1, 1889, when a service between Euston and Manchester was inaugurated with six-wheel stock. The absence of continuous corridors necessarily confined the service to the occupants of the one vehicle. The London—Glasgow—Edinburgh service began on July 1, 1891; vestibuled trains with continuous corridors were brought into use between London and Glasgow on July 1, 1893, and included in their make up both first and third class dining cars. Dining cars on the

London—Holyhead day Irish Mail service were put into service for the first time on July 1, 1895. The first L.N.W.R. 60-ft. 12-wheelers (first class) appeared in March, 1895.

* * *

The following extract from a letter received from an Australian Fellow, Mr. R. C. Forsyth, may be amusing, if not of practical value, to motorists in this country. Mr. Forsyth, describing wartime conditions in his remote district of Western Australia, writes: "Producer gas is being used here and many and weird are the containers used to manufacture it. One farmer, driving a Morris Cowley, made a producer out of two cream cans, three Mintie tins, and various pieces of drain pipe. The success of this outfit was proved by his trip to Perth, 170 miles away, on two bags of charcoal, costing the effort of collecting it from two burnt logs. On running out of gas about ten miles from home, he stuffed his old coat and part of a blanket into the producer and finished the trip on that!"—From the "Journal of the Royal Society of Arts."

London & North Western Railway.

COMMENCING SEPTEMBER 1st, 1897.
In addition to the 1st Class Dining Cars now run,

DINING ACCOMMODATION

FOR
SECOND & THIRD CLASS PASSENGERS,

Will be provided by the following Trains,

EUSTON

AND
BIRMINGHAM, LIVERPOOL,

AND
MANCHESTER.

DOWN TRAINS From London (Euston).	UP TRAINS To London (Euston).
WEEK DAYS.	
4.10 p.m. for Liverpool	7.30 a.m. from Birmingham
5.30 p.m. for Manchester	4.5 p.m. from Liverpool
5.30 p.m. for Liverpool	4.15 p.m. from Manchester
5.35 p.m. for Manchester	5.30 p.m. from Manchester
7.0 p.m. for Birmingham	<small>* Breakfast Saloon.</small>
SUNDAYS.	
5.30 p.m. for Liverpool and Manchester	4.5 p.m. from Liverpool
	4.30 p.m. from Manchester

TABLE D'HOTE CHARGES.

DINNERS—First Class 3/6. Second and Third Class 2/6.

Euston Station, August 1897. FRED. HARRISON, General Manager.

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

WESTERN AUSTRALIA

Brunswick Junction Remodelling

Brunswick junction, 99 miles from Perth on the main Perth-Bunbury railway, is a junction for the Collier coal-fields and the marshalling centre for the bulk of the coal produced in the Collier area. Through it also pass large quantities of wheat from the Great Southern wheat belt for shipment at Bunbury, and it is itself, the centre of a thriving and prosperous mixed farming area, which has recently received considerable benefit from irrigation schemes in the vicinity.

For many years the yard has been too small and inconvenient to handle efficiently the heavy and continuous traffic and, in consequence, delays have been frequent, with far-reaching effects on the working at depots considerable distances away. With the construction of branch lines feeding traffic through Brunswick, the lengthening of trains as a result of regrading schemes, and the use of heavier locomotives there has been constantly increasing difficulty in coping with the traffic dealt with at this point. Though minor adjustments and improvements have been effected from time to time, it has long been felt that complete reorganisation was necessary; this has now been carried out.

The Various Works Entailed

The bulk of the sidings comprising the original yard have been removed and an entirely new layout constructed on the opposite side of the main line with entrances from both the Perth and Bunbury ends. These works also necessitated the removal of the passenger platform and buildings to a position some distance on the Bunbury side of the old station. Opportunity was taken in the changeover to recast the design of the building entirely, and it is now a modern wood and asbestos structure with up-to-date offices, refreshment rooms, and waiting rooms. In the centre is an elevated signal box controlling the station and marshalling yards. Included in the reorganisation was the provision of new livestock trucking yards of improved design.

The cost of the work was approximately £32,000. Considerable economy in working is expected from the new yard, which should meet all requirements for many years to come.

NEW SOUTH WALES

Railway Improvements

On October 25 last, a paper was read by Mr. G. Burrows, A.M.I.E.Aust., before the Newcastle Division of Institution of Engineers, Australia, entitled "Recent Improvements in Railway Construction and Maintenance." The greatest permanent way improvement, the author considers, is the standardisation of a 107-lb. per yd.

rail welded in the workshops into lengths up to 360 ft. A chart has been compiled showing the correct expansion gap to be allowed between these long rails according to the temperature at the time of laying, but in no instance is a wider gap than $\frac{1}{8}$ in. allowed.

Another development is the use of rail greasers to obviate wear on the outer rails of curves. The particular type of greaser used is an Australian invention, and is attached to rails approaching all curves with radii up to 20 ch. The greaser consists of a cylinder 6 in. in diameter and 6 in. in depth, filled with a compound of grease and zinc graphite, and provided with a heavy piston to force the lubricant through a tube leading from the base of the cylinder to the inner rail face, where it is picked up by the wheel flanges and distributed round the curve. It is estimated that the life of the rails on such curves has been increased by 70 per cent. as a result of the introduction of these greasers.

Turning to the mechanical side, Mr. Burrows mentioned that the average distance run per engine failure five years ago was 4,000 miles, whereas now it was 50,000 miles due to the greatly improved condition of the locomotives during the interval.

SOUTH AFRICA

Workshops Investigation

A committee has been appointed to report upon the possible further extension of railway workshops; it consists of:—

Mr. J. M. Greathead, Assistant General Manager (Technical), Chairman;
Mr. M. M. Loubser, Chief Mechanical Engineer;
Mr. J. Timperley, Superintendent (Staff), Johannesburg;
Mr. J. Ramsay, Superintendent (Operating), Johannesburg;
Mr. C. W. Edgar, Local Accountant, Capetown; and
Mr. F. B. Lowe, President of the Artisan Staff Association.

The committee's terms of reference will be the same as those of the Departmental Workshops Commission appointed in 1924, whose report the committee will review in the light of present-day standards and with particular regard to the question of the administration embarking upon the construction of locomotives, as well as the possibility of serving the needs of other railways in Africa in respect of manufactured railway equipment, due consideration being given to the economic aspects. In carrying out its investigation the committee will also pay due regard to the recreational and other facilities available at the various centres to members of the workshops staff.

The terms of reference of the 1924 Commission were as follow:—

(1) The capability or otherwise of the existing workshops to deal economically and expeditiously with the maintenance of rolling stock at the present time.

(2) The necessity or otherwise of enlarging and extending the existing workshops, man power, and machinery, with a view to the maintenance of an increased quantity of rolling stock.

(3) The capability of the existing workshops to manufacture wagons, coaches, and locomotives, as well as other railway requirements such as points and crossings, bridge material, spare parts for machinery and plant and the like.

(4) The advisability of enlarging and extending the existing workshops and machinery with a view to increasing the work of manufacture of wagons, coaches and locomotives, as well as other railway requirements.

(5) The alternative of establishing an entirely independent workshop wherein manufacturing work could be standardised and, if necessary, such maintenance work as other workshops may be unable to undertake. Consideration to be given to the question of the site or locality most likely to lead to economic manufacturing costs and expeditious output.

(6) The extent to which manufacturing work could be undertaken for Union Government departments in any existing workshops enlarged to undertake additional manufacturing work or any proposed new workshops.

(7) The question of increased utilisation of South African products in manufacture, repair, etc.

Union-Rhodesia-Belgian Congo Conference

The Minister of Commerce and Industries, Mr. R. Stuttaford, announced in the House of Assembly recently that a conference of the ministerial and senior representatives of the railways of the Union, Rhodesia, and the Belgian Congo is to be held in June at Bulawayo. The conference is the result of meetings held in the Union in recent months between M. de Vleeschauwer, Belgian Minister of Colonies, and the Union Government, and subsequently between the railway administration and the senior representatives of the Rhodesia Railways.

Matters to be discussed at the conference were aimed at a closer economic collaboration between the Union and the Northern States, which is being fostered as far as possible by the Union Government to open up the vast new trade markets which the war has brought more prominently into the open.

MEXICO

280-mile Construction to Begin

Some time ago the Mexican Government granted a concession to the Cia. Mercantil, Industrial y Constructora to build a railway 280 miles long which would connect the States of Oaxaca and Chiapas. The company has now raised funds totalling \$10,250,000 and construction of the line is to begin.

BRAZIL

Railway Extensions

The Department of Transportation and Public Works is planning the extension of lines from Bananios to Picui, in the State of Paraiba, and a sum of \$1,000,000 has been allocated to the first section of the constructional work.

WINDSCREEN WIPERS FOR LOCOMOTIVES

New types operated by compressed air at standard air brake pressure, as adopted by British main-line railways

A WINDSCREEN wiper for the look-out windows of locomotives was described in THE RAILWAY GAZETTE of March 3, 1939 (page 467). This windscreen wiper, in which hot water under pressure was used for operating the mechanism, was tried on a locomotive of the "Lord Nelson" class of the Southern Railway. More recently, two types of windscreen wiper for railway use have been introduced by the Metropolitan-Vickers Electrical Co. Ltd., a lightweight model and a larger and heavier one, both operated pneumatically at standard pressure from the air

arm passes through the framing to the outside, a brass bush being used to exclude moisture. The wiper arm is hinged and adjustment is provided to bring the wiper blade into contact with the glass, the blade itself being equipped with a rubber squeegee which is reversible by undoing a few bolts. The weight of the arm is balanced by a tension spring arranged on the outside of the locomotive or vehicle, and a screw-down needle valve to regulate the starting and speed of operation is included as part of the equipment. The air engine is shown diagrammatically in Fig. 1 and operates as follows. In the cylinder is a double-ended piston, at the extremities of which are two projections, A, A1. The cylinder ends are not solid but consist of flexible diaphragms B, B1. At each end of the cylinder is a valve box, C, C1, fitted with ball valves, D, D1, which are actuated by push rods, E, E1, fixed to the diaphragms. The valve boxes are connected by pipes to each end of the cylinder and to the air supply, as shown, and can exhaust through the inner valve seatings along the spindles E and E1.



Fig. 1—View in outline of operating cylinder

brake supply. They can thus be used on diesel-driven railcars, steam locomotives or electric rolling stock. Although the operating mechanisms are different, both are of very robust construction, not only so that they will work under difficult conditions such as clearing driving sleet, but also so that they will stand the shocks and rough usage imposed on them by modern methods of railway vehicle cleaning.

In the case of the larger and heavier type, the arrangement consists of a self-acting air engine which is mounted inside the cab, from which a driving spindle for the wiper

When the supply pipe is coupled to the air pressure system, compressed air will flow past the valves, forcing the balls D, D1 on to their inner seats and passing through the pipes into the cylinder ends F, F1. Air pressure mounts up at a different rate in the two ends of the cylinder, due either to the position of the piston or to minute differences in the valve ports or the piping. Consequently, as the diaphragms are deflected at a definite air pressure one is deflected before the other. Assume that B is deflected first: then valve D is immediately changed from its inner seat to its outer, thus cutting off cylinder F1 from the air supply and connecting it to atmosphere through the port surrounding spindle E. The pressure in cylinder F is, however, still

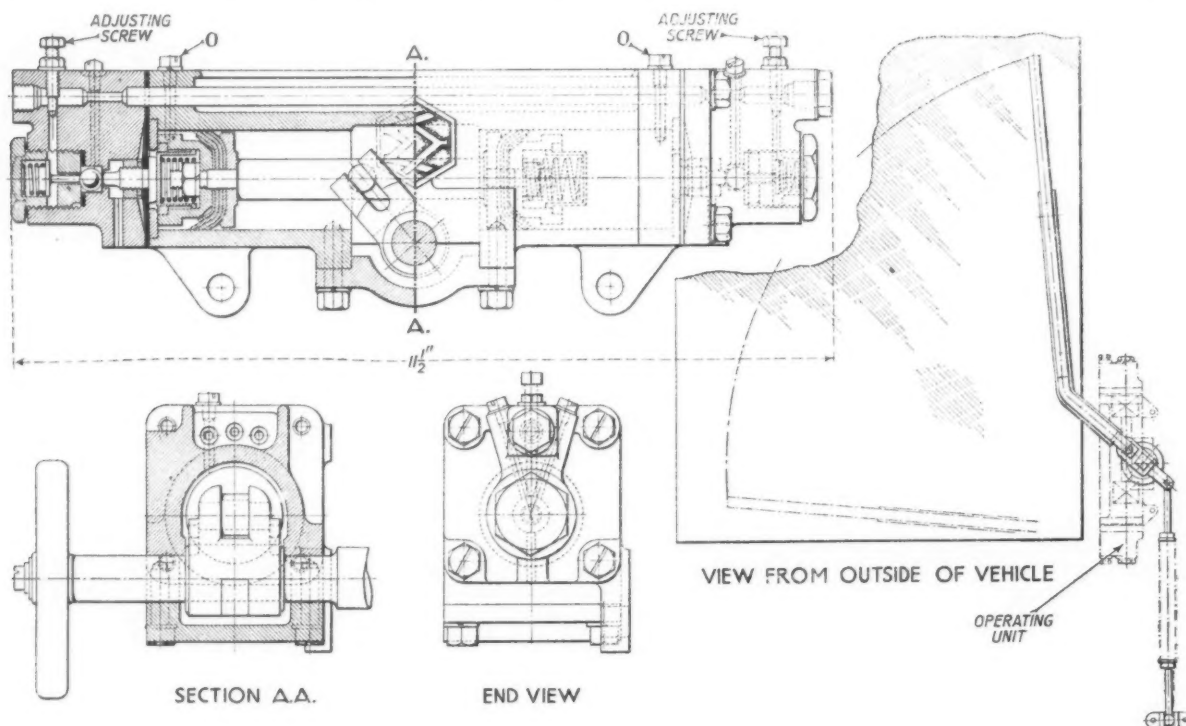
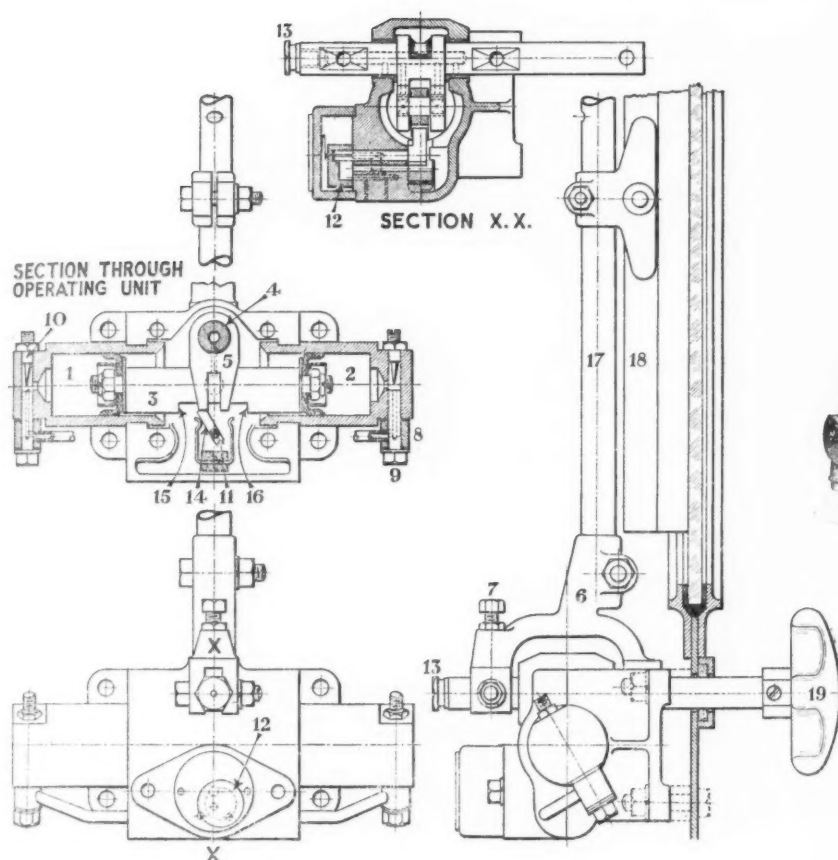
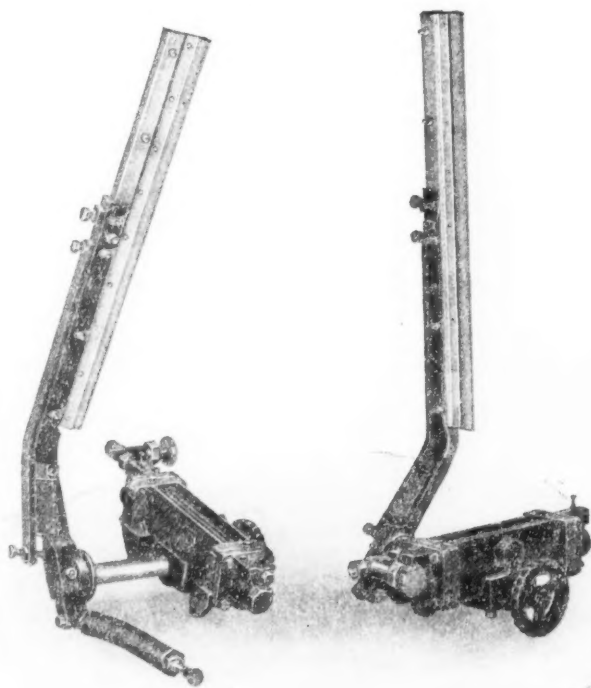


Fig. 2—General arrangement of windscreen wiper showing details and application to window



Above: Front view of lightweight model

Left: Fig. 3—Details of lightweight screen wiper



Complete view of heavier type of screen wiper adapted for fixing to motor-coach

maintained, and the piston accordingly moves from right to left. When the projection A1 reaches diaphragm B1 it deflects it. The ball D1 is thus transferred to its outer seat, cutting off the air supply to cylinder F and connecting it to atmosphere. When the pressure in F has decreased to a certain value, D is forced by the air supply on to its inner seat, and air is supplied to cylinder F1. The piston now moves from left to right, the diaphragm B1 being still held in the deflected position by the air pressure. In this manner a continuous reciprocating motion is produced until the air supply is interrupted. The general arrangement in Fig. 2 shows this principle as applied in practice. Two oil holes are provided in the bearing cap for lubricating the operating shaft. To lubricate the cylinder the two small screws marked O in the cylinder casting are unscrewed and a small amount of oil injected. Orders for over 2,500 wipers of the type described above have been received from the Southern, L.N.E. and L.M.S. Railways. The drawings show one typical design, but various modifications are available to suit different requirements as to length of blade, shape of arm, and angular movement.

The Lightweight Model

The lightweight model of wiper is built rather differently. Referring to Fig. 3, a double-ended piston rod 3 is fitted with a pin in the centre for operating the rocker lever which carries the wiper arm and blade. The piston at each end of the rod moves in its own cylinder, and compressed air is directed by means of valves into these cylinders in such a manner that the piston is driven backwards and forwards causing the blade to oscillate with a wiping action across the surface of the window. The two cylinders 1 and 2 are separate units held together and located in correct alignment by two centre clamp die castings which form the body or crankcase of the wiper. At the top of this crankcase are two bearings bushed to carry the main operating spindle 4, and

on to this spindle is welded the fork 5 which engages with the pin in the centre of the piston rod. The spindle has two flats on each side of it, machined at two places just outside the bearings, and bolts through these flats secure the lever arm 6 to the spindle. The front end of the lever arm is slotted instead of being drilled and this allows the rear lever

left, so that No. 2 cylinder is now cut off from the air supply A, and No. 1 cylinder is disconnected from exhaust E. The movement of the piston to the left then continues, due to the expansion of the air in No. 2 cylinder which is still above atmospheric pressure. At (d) the piston has reached a position just before the end of its stroke with No. 2 cylinder just being connected to exhaust E, the air in No. 1 cylinder now being slightly compressed. The remaining view (e) shows the piston at the end of its travel; No. 1 cylinder has now been connected to the air supply A and, as this occurred just before the completion of the movement, a small pressure is built up in No. 1 cylinder which acts as a cushion and prevents shock due to the sudden stopping of the moving parts. No. 2 cylinder is now in full communication with the exhaust port E so that everything is ready for the commencement of the return movement of the piston. During the movement of the piston from left to right, connections between the valve ports and the two cylinders are made and varied as described above, reading No. 1 cylinder in place of No. 2 and *vice versa*, and reading "right" instead of "left" for the direction of movement.

A lubricating nipple screwed into the valve face at L serves to introduce oil into the valve chest, and this is carried to the cylinders by the compressed air. In addition to this, a lubricator 13 (Fig. 3) is screwed into the end of the lever arm spindle which is drilled axially and radially so that it allows oil to flow to both bearings and to the wearing faces of the work and spindle.

Mounting on Vehicle

The wiper engine is mounted on the outside, with the operating spindle passing through the window framework to the inside, a gland being provided to prevent a draught passing along the spindle into the coach. A handle 19, Fig. 3, is fixed to the end of the spindle inside to start the engine in the event of its having been stopped with the valve in a mid-position. The wiper arm has a sweep of approximately 80 deg. on the glass, and the position of the wiped area can be adjusted by moving the split clamp up and down the wiper arm. This need not necessarily be straight but can be bent to suit any particular type of locomotive or coach construction.

Railway Altitude Records

Some new details have recently come to light concerning maximum railway altitudes in the United States, which show that, apart from the 14,109 ft. reached by the Manitou & Pike's Peak rack-and-pinion line in Colorado, the record is held by the Denver & Rio Grande Western, which with a standard-gauge branch reaches a height of 11,522 ft. above the sea at Ibex, in the same State. The Colorado & Southern Railway, which is a subsidiary of the Chicago, Burlington & Quincy, closely approaches the latter figure with an altitude of 11,319 ft. at Climax, Colorado, but this is a narrow-gauge line. Altogether there are three standard-gauge and five narrow-gauge railway summits exceeding 10,000 ft. in the U.S.A., all in Colorado. These are relatively modest altitudes compared with those of South America, where the metre-gauge Antofagasta (Chili) & Bolivia Railway goes over 15,817 ft. at Montt, on its Collahuassi branch, and the standard-gauge Central of Peru attains 15,806 ft. at La Cima, on the Morococha branch. But perhaps the most remarkable feat is that of the Peruvian Central main line in climbing from the Pacific port of Callao to 15,694 ft. in the Galera tunnel in a distance no greater than 107 miles; the grade averages 1 in 36 for the entire distance, and 1 in 29½ over the 60 miles from San Bartolomé to the summit, with a ruling inclination of 1 in 22½—the most severe task of haulage imposed on steam locomotives working by adhesion in any part of the world. By comparison, the European altitude records are held by the Jungfrau and Gornergrat railways in Switzerland, both electrically-operated rack-and-pinion lines, with 11,340 and 10,236 ft. respectively; and, for a line affording through communication, by the Bernina Railway, which at Bernina Hospice touches 7,400 ft., approached by a ruling gradient of 1 in 14, worked by adhesion.

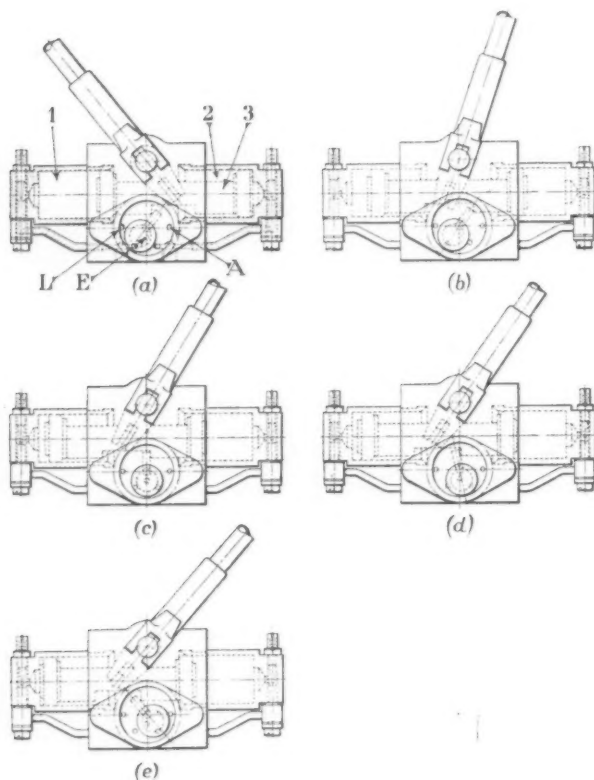


Fig. 4—Lightweight model: positions of valve in relation to valve ports for varying positions of piston

arm bolt to act as a hinge about which the arm can pivot. Thus, by means of the adjusting screw 7, the rubber of the wiper blade can be arranged to lie flat on the glass. The lever arm carries a split clamp which holds the wiper arm 17 in position. This wiper arm is a tube with recesses cut in it so that the lever arm bolt and the blade carrier bolt engaging in these prevent the tube from turning. The blade 18 itself consists of two steel plates which are riveted together and which carry the wiper rubber. The remaining numbers on the drawing Fig. 3 refer to the following parts: 8, air connection ring; 9, air connection bolt; 10, adjusting screw; 11, striker arm spindle; 12, port control valve keyed to striker arm spindle; 13, lubricator; 14, striker arm; 15 and 16, strikers on underside of piston rod.

Operating the Screen Wiper

Fig. 4 shows the different positions of the valve in relation to the valve ports for varying positions of the piston. The view (a) shows the piston 3 at the extreme position to the right, i.e. at the end of No. 2 cylinder. No. 2 cylinder is now connected to the air supply A, while No. 1 cylinder is connected to exhaust E, so that the air pressure begins to push the piston to the left. At (b) the piston has moved sufficiently far to the left for the striker on the underside of the piston rod to come into contact with the striker arm of the valve. The connections to the valve ports are as in Fig. 3. In the view (c) the piston has moved further to the

AUTOMATIC INTERLOCKING IN NEW ZEALAND

The New Zealand Government Railways have for some years been installing the most modern signalling equipment available. Automatic crossing loop working is now in service on a busy suburban section

IN the general article on signalling on the New Zealand Government Railways in our issue of January 28, 1938, page 169, reference was made to the intended adoption of automatic interlocking on the Wellington to Johnsonville line. This line originally formed part of the main route from Wellington to the north and was equipped with mechanical signalling and Tyer's tablet apparatus. With the opening of the new main route out of the city, the portion of line beyond Johnsonville was abandoned, but it was decided to modernise the remainder, as it serves a suburban district. It runs through precipitous country, along a river gorge, where a double track is not feasible, with grades as steep as 1 in 33. The trains are now electrically operated, on the overhead system. The modernisation of the signalling was carried out under the direction of Mr. G. W. Wyles, the Signal and Electrical Engineer, and provides for complete regular operation of passenger trains without any signalling staff on the ground, except at the Wellington terminus, and is a remarkable example of the latest technical development in this field. The following particulars are taken from an article by Mr. I. D. Stevenson, Assistant Engineer to Mr. Wyles, in our American contemporary, *Railway Signaling*, for December, 1940.

General Layout

The installation was brought into use in July, 1938, and is operated by a.c., with 110-volt dual control point machines, searchlight signals, and vane and motor type relays. The accompanying diagram, from which all marker lights and signs not directly concerned with what follows are omitted for clearness, shows that there are four single line sections each about 1.5 miles long, with two intermediate stations, Ngaio and Khandallah, and one crossing loop, Wadestown, where there is no station. This has been provided for traffic reasons and did not previously exist. There are no intermediate block signals, although the scheme is arranged to allow of their introduction in due course if necessary, but there is a distant signal in rear of every home signal. The signals for leaving a loop and entering a single line section, officially called "departure" signals in New Zealand, are normally at "danger" and the home signals in rear at "caution." The distant signals normally show "clear" in such circumstances, but should the single line section ahead be occupied by an approaching train they show "caution." Trap points provide against any over-running of the departure signals.

At Wadestown the working is entirely automatic, but at Ngaio and Khandallah the mechanical frames still exist and can be used to control the working locally, allowing of shunting movements or crossings between three trains to be made. For the ordinary through movements, or those required when an up train is divided and one half returns to Wellington, while the other proceeds to the terminus, the working is entirely automatic. To allow of dividing the trains, a separate up departure signal is provided on the single line, the up loop outlet signal being known as the starting signal. The ordinary terminal working at Johnsonville is also automatic, but push-button control can be made use of with suitable precautions.

Working of Wadestown Loop

Each of the loop lines will hold a 4-car train and ordinarily only the first of two crossing trains needs to stop, the other being able to run through. During light traffic, one- or two-car trains, if running punctually, can cross without stopping. At certain non-rush hours goods trains are run and, although considerably longer than the loop, can pass four-car trains there. The down trap-points have a train

stop working with them—the same applies to the intermediate stations—and another is fixed three car-lengths ahead of the down home signal, with time relay control imposing a speed limit of 15 m.p.h. on down trains, as a sharp curve and a tunnel severely restrict the motorman's view.

If an up train passes the home signal at yellow and the section towards Ngaio is unoccupied, the points at that end of the loop will reverse and the departure signal will clear; the working in the opposite direction is similar. If another train is being met, the first one is held at the departure signal, and when the second arrives clear of the fouling point the points are set for both to proceed under clear signals. It will be evident that if a train due to cross another arrives before the latter has obtained a clear departure signal at the next loop, then the first train will itself obtain such an indication, which must be cancelled. Two buttons, called "cancelling" (red) and "clearing" (blue) are therefore provided for every departure signal. If the former is used, the signal goes to danger, and after 40 seconds the points return to normal and the opposing train can obtain permission to proceed. If, after all, in consequence of, say, a breakdown, it cannot come, the waiting train can use the clearing button to obtain a signal for itself to proceed. This button does not have to be used, however, if the opposing train comes forward as intended. For either button to be operative the track-circuit approaching the departure signal must be occupied.

Working at Ngaio and Khandallah Stations

The working at the intermediate stations is substantially similar to that at Wadestown, for ordinary through movements. Points, other than the loop points, are rod-worked from the lever frame. When an up train divides, the first half leaves under clear starting and departure signals, and when it has cleared the latter, on the single line, the starting signal shows yellow, allowing the second half of the train to move out. The loop points then return to normal after 40 seconds and the vehicles move into the down loop line, proceeding thence as usual. It is actually possible to reverse this order, so that the first half returns in the down direction, but in that case the cancelling apparatus must be resorted to. Two normally reversed control levers (up and down) are used, in conjunction with the home signal and other levers, when a trainman uses the signal box to control a three train crossing or other movement locally. Full control is given to him after the points, if reversed, have "homed" to normal (for which purpose their track-circuits must of course be unoccupied), which itself occurs 40 seconds after all levers are put normal and signals are at danger. To restore automatic working the home signal and control levers need only be reversed, proving any conflicting levers normal.

Time Control and Block Relay Action

Automatic point operation requires a careful arrangement of circuits, to insure that no unintended movement can be started by the momentary loss of a track circuit shunt. The loop point machines in this installation will not restore to normal unless the governing signals have been continuously at stop and the track circuits concerned unoccupied for 40 seconds, so that no intermittent failure to shunt can create a dangerous condition. Neither can the inadvertent shunting of a track circuit do so. The possibility of two opposing trains reaching the loop track circuit section simultaneously has been met by arranging that the action of an up train is unrestricted, but the action of a down train is subject to the block relay—which reflects the condition of the single line section—remaining in the clear condition for 5 seconds

more, resulting in up trains being given the preference where two trains reach the signal clearing point simultaneously.

In other cases the first train to do so obtains the road, irrespective of its direction. In addition 5 seconds must elapse after a block relay is restored to the clear condition, before any points will reverse to admit a further movement into the section. The block relay circuit detects the local point control track circuits unoccupied, so that this time interval does not begin until the tail of an arriving train has passed the loop fouling point. If trains are waiting at each end of a section while one is running therein, then the following, not the opposing, train first obtains the "proceed" signal when the section becomes clear, but of course the cancelling apparatus can be used to alter this if traffic requirements demand it.

Ngaio and Khandallah signal boxes have track diagrams, with track, signal, point and time relay indication lights. When unattended, only such as are required by trainmen for their information are left burning, and can be consulted

a time switch control was adopted, giving No. 2 line the preference from midnight to noon, and No. 1 line the preference for the remaining hours; whichever line is occupied, however, another approaching train is automatically directed to the other. The control panel is placed in a recess in a relay cabin on the platform, and has white and red lights for track occupation, and signal control lights. When the panel door is closed all are extinguished. A route selecting push button is placed next to each signal on the diagram and, when pushed, sets up the route concerned and clears the signal, if conditions are right for that to be done. A cancelling button allows of the restoration of signals to "stop" and, after the usual 40 seconds time interval, the setting up of some other route. Clearing buttons for use by the guards are placed on the station building walls. There are also the usual telephone "T" call indicators.

An arriving goods train will, of course, find that it has been automatically directed to a platform line, should one be clear, and it must stop at the home signal for the guard to press first a cancelling button, and then a clearing button

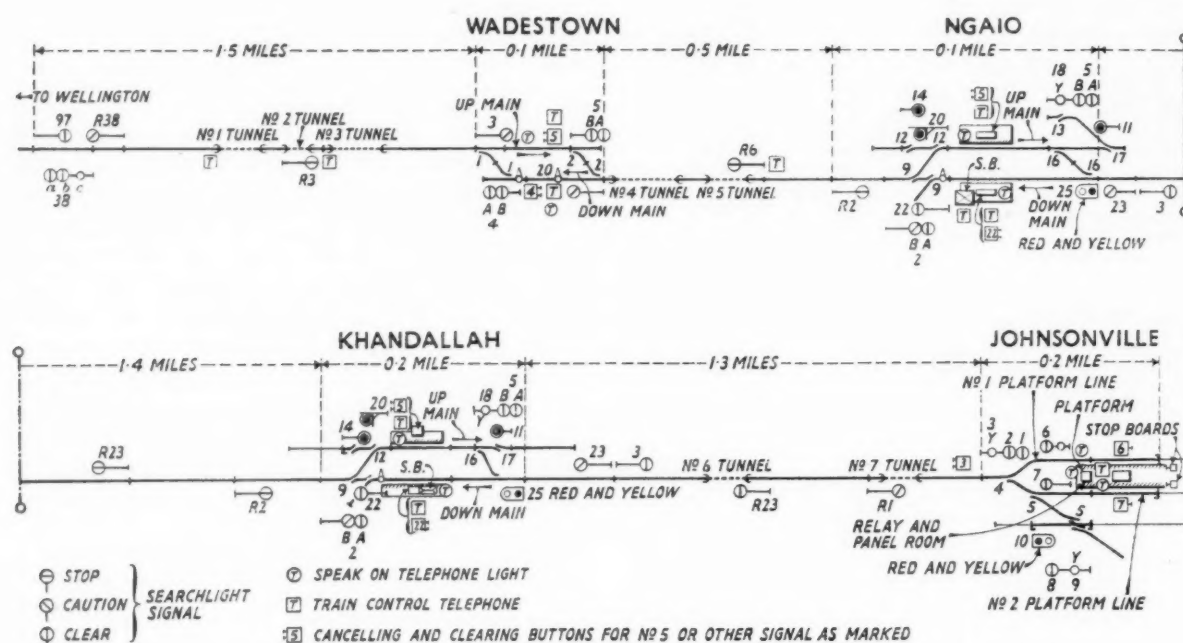


Diagram of the tracks and signals on the Johnsonville branch, extending northward from Wellington, New Zealand Government Railways

by looking through the window. At Wadestown, where there is no box, these indications appear above the cancelling buttons. All crossing places are on the train despatching telephone circuit, and when the despatcher calls a loop (except when the signal box there is open) an illuminated letter "T" is prominently exhibited to attract trainmen's attention, being extinguished by lifting the telephone receiver.

Working at Johnsonville Terminus

At the Johnsonville terminus the old mechanical locking frame has been abolished and a small relay interlocking panel installed, normally unattended. There are two platform lines and a connection to the goods yard. All signals normally show "stop," and, when an up train obtains control of the section from Khandallah, a route is set up to an unoccupied platform line and the relative home signal clears to yellow. Two trains being seldom at the terminus together, it was considered undesirable to give one platform a preference, as this would have led to the other being little used, so

for setting the route into the yard, which occurs after a 40-second interval, during which he can rejoin his train. The subsidiary signal under the home signal then clears. Should there be an employee on duty he can set this route up in advance. This is the only route the controls for which can be prepared before conditions will allow of its being actually established. While the points from the yard are normal, the two subsidiary signals for the shunting neck can be used independently of any cancelling action affecting other routes.

Service Results

In the first 21 months of working with this interesting equipment, 416,195 train-miles were run on the line and 3,344,362 passenger journeys made. In two years every point machine at the three loops had made 76,000 movements, with only 30 signal apparatus failures. Six were due to obstructions in the points, one to a broken rail, and five to excessively bad weather, and were thus not failures, properly so called. An improvement on these figures has since been experienced.

INTERVIEW WITH THE MINISTER OF WAR TRANSPORT

Lord Leathers explains position of railway financial agreement and gives message to railway industry

Lord Leathers, Minister of War Transport, last week accorded the Editor of THE RAILWAY GAZETTE an interview, in the course of which some points of importance to the railway industry were discussed. Among the main subjects covered were the financial agreement between the railway companies and the Government, the movement of coal, co-ordination of transport, and port clearances. Lord Leathers concluded by sending a special message of appreciation and encouragement to all engaged in the railway industry.

In view of the importance of some of the points touched on, and to ensure clarity, the principal questions and answers in the interview are reproduced verbatim below :—

May we expect an early statement on the arrangements which are to succeed the revision of the original financial agreement with the railways ?

My predecessor said that the railway agreement was in the melting pot. So it is. It has been simmering for some time now, but I hope we shall not have to wait long before a new agreement takes its place and an announcement will be made as soon as possible.

Do you adhere to the view of your predecessors that it is essential that an economic basis of railway working must be maintained—that railways must pay their own way ? If so, do you contemplate steps to overcome the lengthy time-lag between the incidence of higher costs and the adjustment of charges or other steps to offset them ?

I am afraid I cannot go into details just now. Everything is being discussed with the railway chairmen.

Is it a fact that the coal transport position is now satisfactory and the problem is now more one of supply ? Have you a plan for keeping pace with the rising output ?

So far as I can see we can carry promptly and swiftly every ton of coal that the miners raise during the next few months. Indeed, I hope they will raise plenty of coal this summer, so that full advantage can be taken of the longer hours of daylight.

Are you satisfied with the efforts which have been made to co-ordinate the activities of (a) the four railways, (b) rail and road ? Are further steps contemplated ?

I do not think I shall ever be satisfied. There can be no finality in co-ordination. We must keep at it all the time. I have only one object and that is to see that all forms of transport pull together and pull their full weight. The merging of the Ministries of Transport and Shipping was a practical example of co-ordination in the field of administration. It reduces the number of authorities to be consulted and should promote smooth working in the ports. In deciding

on the next move, I shall, of course, have the advice of the Inland Transport War Council, whose members are specially qualified by knowledge and experience to deal with this problem.

Has there been a substantial improvement in port clearances in recent weeks ?

The returns kept of the time spent by tramp ships in port show in most cases a steady and progressive improvement during recent months in the turn-round of these ships. This improvement is due to a number of causes, among which are the organisation at the major ports for planning the reception and clearance of cargoes and the influence of the lengthened days which enable work to proceed for longer hours with the advantage of daylight.

Is there any message you would care to give to the railway industry through THE RAILWAY GAZETTE ?

I know something of the difficulties under which railwaymen are working and can appreciate the measure of their achievement. They have displayed amazing ingenuity in meeting the challenge of enemy bombers and also in adapting themselves to the new conditions imposed by war. There is no lack of courage or resource in that quarter.

Railwaymen, in common with other inland transport workers, are now closely associated with the men of the Merchant Navy in keeping open our line of communication with America. The result of that struggle depends in no small degree on the speed with which we turn round our ships. There are many ways of expediting this operation and not the least is by ensuring that there is no hitch or hold up in the movement of goods from the quayside to the factory gate or consumer.

Above all else, therefore, I ask every railwayman to go on scheming and working out new ways of keeping our munitions on the move, so that all available material—and particularly that from our friends in America—may reach its destination without a moment's delay. Every man who is in a position to save one hour in a wagon's journey helps to shorten the war. That's their job and mine.

It will be seen that Lord Leathers cleared up doubts on several important points relating to the railway industry. For the first time he made an authoritative pronouncement indicating that a new financial agreement between the railways and the Government is being negotiated between the Government and the transport undertakers to take the place of the original agreement, and announced that discussions are at present in progress between the Government and the railway chairmen.



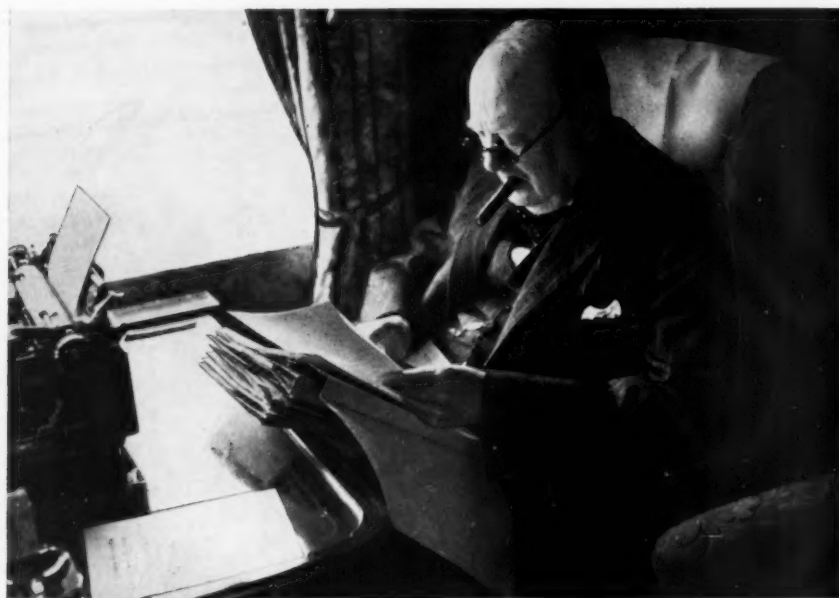
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[G. Fry

Baron Leathers of Purfleet

Minister of War Transport

British Railways and the War—75



The Prime Minister at work in his special train which he uses extensively for travelling about the country



An L.M.S.R. employee at Kentish Town, believed to be the first woman "knocker-up" in this country. She makes from 10 to 15 bicycle calls a day knocking up drivers and firemen



Women porters on the L.M.S.R. unloading a van during one of the periodical 15-minute respirator drills carried out while normal work is continued

RAILWAY NEWS SECTION

PERSONAL

CABINET CHANGES

The Rt. Hon. Lord Beaverbrook to be Minister of Supply.

The Rt. Hon. Sir Andrew Rae Duncan, O.B.E., M.P., to be President of the Board of Trade.

Mr. Oliver Lyttelton, President of the Board of Trade, appointed to special duties abroad.

INDIAN RAILWAY STAFF CHANGES

The services of Mr. J. N. Compton, officiating Deputy Transportation Superintendent (Power), G.I.P.R., have been placed at the disposal of the Department of Supply as from February 15.

Mr. G. J. Eades, Deputy Chief Engineer, Signals, N.W.R., has been permitted to retire from Government service as from March 15.

Mr. R. B. Seth has been appointed to officiate as Deputy General Manager (on special duty), E.B.R., as from February 28.

Mr. K. B. Ray has been appointed to officiate as Deputy General Manager (Works and Secretary), E.B.R., as from March 6.

Mr. B. N. Chopra has been appointed to officiate as Deputy Chief Engineer, E.B.R., as from March 5.

Mr. W. L. Newnham has been appointed Engineer-in-Chief and Under-Secretary, Public Works Department in New Zealand. It will be remembered that all new railway construction work in the Dominion is carried out by that department, and only after the consolidation of the formation are the various lines handed over to the Government Railways for working. Mr. Newnham joined the Public Works Department in 1906, and until his latest promotion was Assistant Engineer-in-Chief.

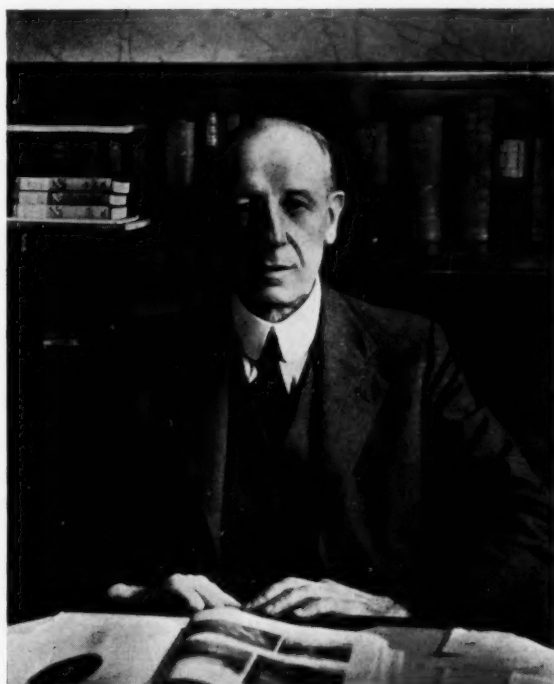
L.N.E.R. APPOINTMENTS

Mr. George Mills, Divisional General Manager, Scottish Area, to be Divisional General Manager, Southern Area, in succession to the late Colonel H. H. Mauldin.

Mr. R. J. M. Inglis, Engineer, Southern Area, to be Divisional General Manager, Scottish Area.

Mr. J. C. L. Train, Engineer, Scottish Area, to be Engineer, Southern Area.

RETIREMENT OF MR. C. B. COLLETT
Mr. Charles Benjamin Collett, as we recorded briefly in our issue of May 30, is retiring on July 5 from the position of Chief Mechanical Engineer to the Great Western Railway, which he has held since January, 1922. Mr. Collett went to the Merchant Taylors' School, and after studying at the City and Guilds



Mr. C. B. Collett, O.B.E.

Chief Mechanical Engineer,
Great Western Railway, 1922-1941

(Engineering) College, was articled to Joshua Field of Maudslay, Sons & Field, then eminent marine engineers. In May, 1893, he entered the G.W.R. drawing office at Swindon, and five years later was appointed Assistant to the Chief Draughtsman. In 1900 he was made Assistant Manager of the locomotive works, of which he became Manager in 1912. In 1919 he was appointed Deputy Chief Mechanical Engineer, and three years afterwards succeeded Mr. G. J. Churchward as Chief Mechanical Engineer. During the last war Mr. Collett, as Works Manager, was responsible for the assistance rendered by the company in connection with munitions, and for this service he received the O.B.E. In 1927 the company was asked to send Mr. Collett's then newly-completed four-cylinder 4-6-0 express locomotive No. 6000, *King George V*, to the Centenary Exhibition of the

Baltimore & Ohio Railway at Baltimore, after which the engine made a number of runs on American railways. An American comment at the time was that the workmanship of the locomotive was equal to that of a high-class automobile, an opinion which no one in this country would dispute. In token of their appreciation of his work as a locomotive designer, the Directors of the G.W.R. presented Mr. Collett with a silver model of the *King George V*.

Mr. Collett played a prominent part in connection with the equipment of Great Western Railway main-line locomotives with automatic train control, which was one of the outstanding developments in British railway operation, and an important contribution to the company's safety record. He was a member of the second special committee set up in 1927 by the Ministry of Transport, under the Chairmanship of Sir John Pringle, to consider the possible introduction of a standard system of A.T.C. in this country. The committee unanimously recommended the Great Western system.

Extensive additions have been made to the Swindon works during Mr. Collett's tenure of office, including an extension of the iron foundry, a new pattern shop, new carpenters' shop, new permanent way, carriage repair, spring, and carriage carpenters' shops. A new carriage stock shed, 1,860 ft. long, with ten roads, has also been built during the last few years.

Apart from Swindon, the former works of the Rhymney Railway at Caerphilly have been modernised, and a new carriage lifting shop provided. In addition, the locomotive works at Wolverhampton have been modernised. A new carriage stock shed similar to that at Swindon has also been provided at Cherry Orchard, and the carriage shed at Old Oak Common greatly enlarged. In 1924 the Electrical Department came under the supervision of the Chief Mechanical Engineer, since when the electric and hydraulic plant at the company's South Wales docks has been extensively modernised.

It was under Mr. Collett that the old, somewhat rough-and-ready system at Swindon was replaced by a modern works system of accuracy. Formerly a boilermaker was manager of the boiler shop, and although certain boilers were nominally interchangeable between

different locomotives, in fact the slight differences which existed in dimensions either involved a considerable amount of work before some of the boilers could be fitted, or actually prevented interchangeability. Mr. Collett appointed an engineer in place of the boilermaker as manager of the shop, and also introduced the Wageor system of boiler construction and repair, with its special plant*; thereafter all the work was done to a degree of accuracy previously attained but seldom.

In his relations with his staff Mr. Collett's quiet and helpful manner overcame many difficulties, and gained for him the confidence and respect of the men in the department over which he presided.

We regret to record the death of Captain Sir David Wilson-Barker, R.D., R.N.R., at the age of 82. Sir David was a Director of the Nitrate Railways Co. Ltd.

Mr. H. C. Drayton has been elected a Director of the Buenos Ayres & Pacific Railway.

SOUTH AFRICAN RAILWAY STAFF CHANGES

Colonel C. M. Hoffe, Director General of Railways, Harbours & Sea Transport in South Africa, General Manager, South African Railways & Harbours, has been promoted to the rank of Acting Brigadier.

Mr. J. Rogan, System Manager, Windhoek, has retired from the service.

Lieut.-Colonel A. S. Leverton, Manager, S.A.R. & H. Road Motor Services, has been appointed Director, Air Technical Services, at Defence Headquarters, with the rank of Colonel.

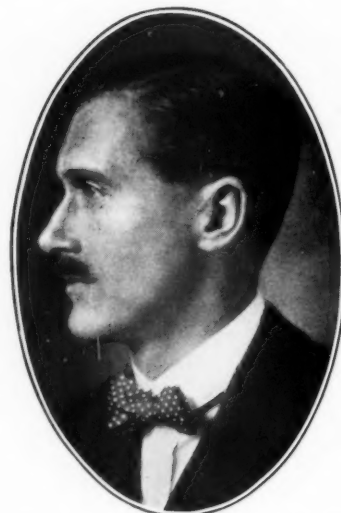
We regret to record the death on June 11 of Mr. Harry Clifford-Turner, the well-known City Solicitor. Mr. Clifford-Turner, who was 65 years of age, practised in the City for more than 40 years and originally acted for the leading cartage contractors. He was associated with the formation of the London Public Omnibus Co. Ltd., and was concerned as a Solicitor with other London bus enterprises absorbed by the London General Omnibus Co. Ltd. and the London Passenger Transport Board.

Mr. William Lionel Hichens, whose death by enemy action we recorded in our issue of October 25 last, has left estate valued at £5,408 (net £2,573). Mr. Hichens was Chairman of Cammell, Laird & Co. Ltd., and a Director of the London Midland & Scottish Railway.

Davey, Paxman & Co. (Colchester), Ltd., announces that it has appointed Mr. W. A. Sycamore to be Sales Manager, and Mr. A. C. Parker to be London Manager & Deputy Boiler Manager.

* Fully illustrated and described in *The Railway Engineer* of February 1929 and June 1930, and, more briefly, in *THE RAILWAY GAZETTE*, of January, 1931, p. 895.

Mr. Joseph Fearfield, C.I.E., Manager of the Bikaner State Railway, whose death occurred on June 17, was born in 1883 and after passing the Mechanical Sciences Tripos, Cambridge, joined the London & North Western Railway as an apprentice in the office of the Chief Engineer. He was appointed Assistant Engineer on the Jodhpur-Bikaner Railway in December, 1904, and during the ensuing 20 years acquired considerable experience of constructional work, notably when he took charge of the Degana-Hissar and Mirpur Khas Khadro extensions. Mr. Fearfield became District Manager in 1910 and in this capacity, handled a great deal of traffic and engineering



The late Mr. J. Fearfield, C.I.E.

Manager, Bikaner State Railway, India, 1924-1941

work. In 1922 he acted as Manager of the railway and after being relieved took up the duties of the new post of Deputy Manager and undertook the reorganisation of the commercial and centralised claims work. In 1924, Mr. Fearfield was selected by His Highness the Maharajah of Bikaner to be Manager of the Bikaner State Railway, and took up the appointment on November 1 of that year.

We regret to record the death at Eastbourne on June 22, at the age of 84, of Mr. Edward Watkin, the last General Manager of the former Hull & Barnsley Railway Company. Mr. Watkin, who was a nephew of the late Sir Edward Watkin, entered in 1871 the service of the Manchester, Sheffield & Lincolnshire (afterwards Great Central) Railway Company as an apprentice in the Accountant's office. In 1875 he transferred to the Audit Office, and on December 1, 1880, was appointed a travelling auditor. Promoted to be Chief Clerk in the Coal Audit Office in 1884, Mr. Watkin was, on January 1, 1886, made Assistant Mineral Manager, succeeding on March 1, 1887, to the position of Mineral Manager,

which he held for over eighteen years. In 1905 he left Great Central Service to become General Manager of the Hull & Barnsley Railway Company and retired on the amalgamation of that undertaking with the former North Eastern Railway Company under the scheme of 1922.

Lord Somers, K.C.M.G., D.S.O., M.C., D.L., has been elected a Director of the Great Western Railway. Lord Somers is the Chief Scout.

We regret to record the death on June 26 of Mr. C. Peter Sandberg, C.B.E. The funeral service took place at Crockham Hill on June 28.

INDUSTRIAL & EXPORT COUNCIL

Mr. Charles Dukes has resigned from the Industrial & Export Council, and Mr. H. Harrison has been appointed to the Council in his place. Mr. H. Harrison is the National Industrial Officer of the National Union of General & Municipal Workers. Mr. Charles Dukes is the General Secretary of that union.

We regret to record the sudden death on June 22 of Mr. Frank Bullough, M.B.E., who was formerly Assistant to the Superintendent of the Line, Lancashire & Yorkshire Railway, and was subsequently in the service of the London Midland & Scottish Railway. He received the M.B.E. in 1920.

We regret to announce the death of Mr. Montague Evans, Chairman of C. E. Heath & Co. Ltd., insurance brokers and underwriters, on June 27. He was the third son of the late Sir David Evans, Lord Mayor of London, and after being educated in England and Heidelberg he joined the firm of Mr. Cuthbert E. Heath, an outstanding underwriting member of Lloyd's. On the death of Mr. Heath two years ago Mr. Evans succeeded to the chairmanship of C. E. Heath & Co. Ltd., of which he had been an original director. He was a Member of the Committee of Lloyd's and Director of the British Aviation Insurance Co. Ltd. and the Excess Insurance Co. Ltd.

G.W.R. APPOINTMENTS

Mr. H. Adams-Clarke, Staff Assistant to the General Manager, to be Chief Staff and Establishment Officer.

Mr. F. C. Hall, Locomotive Running Superintendent & Outdoor Assistant to the Chief Mechanical Engineer, to be Principal Assistant to the Chief Mechanical Engineer.

Mr. W. N. Pellow, Divisional Locomotive Superintendent, Old Oak Common, to be Locomotive Running Superintendent & Outdoor Assistant to the Chief Mechanical Engineer.

Mr. H. G. Kerry to be Divisional Locomotive Superintendent, Old Oak Common.

Mr. R. W. Woolcott to be Assistant to the Chief Mechanical Engineer.

TRANSPORT SERVICES AND THE WAR—96

Message from Lord Leathers to the railway industry—R.E.C. poster on increased canal charges—Wartime newspaper production and transport—Railway traffic after air raids—Maize as locomotive fuel in Argentina—Swiss railway problems—U.S.A. and the enemy countries

The British railways have been examining various methods for quickly disposing of traffic at stations and other terminal points. One suggestion is that improvement would result if the railway staffs could deliver and collect consignments

These figures show a reduction of more than 77·5 per cent. The effect of these figures on the bulk of newspaper transport is obvious, but the considerably more complex problems involved by emergency publication arrangements (to which

Message to the Railway Industry from the Minister of War Transport

I know something of the difficulties under which railwaymen are working and can appreciate the measure of their achievement. They have displayed amazing ingenuity in meeting the challenge of enemy bombers and also in adapting themselves to the new conditions imposed by war. There is no lack of courage or resource in that quarter.

Railwaymen, in common with other inland transport workers, are now closely associated with the men of the Merchant Navy in keeping open our line of communication with America. The result of that struggle depends in no small degree on the speed with which we turn round our ships. There are many ways of expediting this operation and not the least is by ensuring that there is no hitch or hold up in the movement of goods from the quayside to the factory gate or consumer.

Above all else, therefore, I ask every railwayman to go on scheming and working out new ways of keeping our munitions on the move, so that all available material—and particularly that from our friends in America—may reach their destination without a moment's delay. Every man who is in a position to save one hour in a wagon's journey helps to shorten the war. That's their job and mine.

Message given by Lord Leathers to the railway industry through THE RAILWAY GAZETTE.
(See interview page 13)

from trade premises when they are normally closed for the weekly half holiday, or on a Saturday when the premises are closed. It is suggested that, with fire-watchers constantly in attendance at buildings, it should be possible to arrange this without additional expense.

Wartime Newspaper Production and Transport

Some further information on the subject of wartime newspaper production was given recently by Mr. Stanley Bell, Chairman of the Rationing Committee of the Newsprint Supply Co. Ltd. He said: "At the outbreak of war the total consumption of newsprint by newspapers in the country was 1,108,952 tons per annum, or 21,326 tons a week. The consumption of newsprint by newspapers since the war has been gradually reduced voluntarily by the newspapers, until today it is less than 249,000 tons per annum; the actual figure for the week ended May 25, 1941, was 4,719 tons.

NOTICE OF INCREASE OF CHARGES ON RAILWAY-OWNED CANALS

NOTICE IS HEREBY GIVEN that, pursuant to the Railway-Owned Canals (Increase of Charges) Order, 1941, the tolls, dues, charges in respect of wharfage or craning, tugging charges and empty boat charges, in force on 25th March, 1941, in respect of the Canals and Navigations set out hereunder will be increased by 16½ per cent. on and from the first day of May, 1941, subject to the following Fractions Rule:—

If any increased toll, due or charge includes a fraction of 1d. the fraction, if less than ½d., shall not be charged, otherwise it shall be charged as 1d.

CANALS AND NAVIGATIONS REFERRED TO ABOVE

Ashby-de-la-Zouch Canal	Peak Forest Canal
Cromford Canal	Wharfedale Navigation
Muddersfield Canal	Edinburgh and Glasgow Union Canal
Lancaster (North End) Canal	Bracon and Aberrymore Canal
Manchester Bolton and Bury Canal	Monmouthshire Canal
St. Helen Canal	River Kennet Navigation
Trent and Mersey Navigation	Kennet and Avon Canal
Shropshire Union (Coalport Branch) Canal	River Aron Navigation
Ulverston Canal	Bridgewater and Taunton Canal
Shropshire Union Canal	River Tone Navigation
North and Clyde Canal	Grand Western Canal
Huddersfield Canal	Stourbridge Extension Canal
Aulton Canal	Stratford-upon-Avon Canal
Barnsley and Ripon Canal	Swansea Canal (including the Trowbridge Canal)
Chesterfield Canal	Thames and Medway Canal
Pool Dyke Navigation	Kensington Canal
Macclesfield Canal	

April, 1941.

BY ORDER,
THE RAILWAY EXECUTIVE COMMITTEE

Recent poster announcement by the Railway Executive Committee on advance in charges by railway-owned canals

we referred at page 688 of our June 20 issue) should be considered in conjunction with the total weight of newspapers in considering the successful solution of rail and road newspaper transport problems in war conditions.

Southern Railway and War Weapons Weeks

The Southern Railway Company has already subscribed nearly half a million pounds towards the London and provincial war weapons weeks. To local "weeks" the company has subscribed £277,500 to 150 provincial towns served by its system. In addition, it contributed £200,000 of the million pounds subscribed by British railways to the London week.

Railway Traffic after Air Raids

The British railways suggest that after a heavy air raid traders within the areas affected should at once advise the

railway companies how they are placed to receive or send goods and at the same time they should request those about to send goods to them to hold them until they are able to accept them. Until normal conditions are restored this advice should be frequent. After air raids some firms already keep the railways informed as to their position, and this helpful information is greatly appreciated. There are, however, many others who do not do so, with the result that it is not known for some time whether they are able to receive deliveries or to make forwardings.

L.M.S.R. Metal Salvage Drive

The L.M.S.R. has reported to the Iron & Steel Control of the Ministry of Supply that it has salvaged 110,000 tons of scrap iron and steel and reconditioned a further 10,000 tons which in normal times would have been replaced by new material. This contribution to the war effort has been made possible through the work of the company's Redundant Assets Committee, set up prior to the war. The first survey authorised the removal of 2,450 items, resulting in the recovery of about 100,000 tons of ferrous metal scrap. The subjects included sidings, crossovers and connections, bridges, weighbridges and weighing machines, cabins, and huts, cast-iron lamp standards, turntables, cranes, running sheds, and railings at stations. In January, 1940, the committee made a further survey including all items omitted previously owing to the cost of removal being uneconomical. Since then 1,000 additional items have been sanctioned for removal, and some 10,400 tons of iron and steel have been forwarded to the consuming works.

Economy in Use of Consumable Stores

Reference has been made in THE RAILWAY GAZETTE on several occasions to the general salvage drive organised by the L.M.S.R., the success of one section of which is indicated in the foregoing paragraph. More recently the company decided to start an intensive campaign to enlist the aid of the staff in economising in the use of consumable stores. The first step in this campaign was the issue of the following appeal by Mr. Ashton Davies:—

LONDON MIDLAND AND SCOTTISH RAILWAY COMPANY
Office of Vice-President,
Headquarters,
Watford.
19th June, 1941.

IT COSTS YOU NOTHING

Economy has been urged and practised in the past, but new reasons prompt me to send you this personal message. Stocks of material in this country are limited, and it is essential for victory that they be used only in the most sparing way. If in your job, wherever or whatever it is, you can by the exercise of still greater care and ingenuity save fuel and stores, you will be helping to guard our vital reserves.

Waste in any form squanders supplies which it may not be possible to replace, and it is up to each one of us to play our part in getting the maximum use from every bit of material issued. Though the saving you can make individually may be small, don't be discouraged. Every little saving counts and when added to the results attained by your fellow-workers on the L.M.S. it will swell to a worth-while total.

I want everyone to co-operate willingly in this endeavour to save material. Whether it is a drip of oil, a shovel of coal, a brush you use just a bit longer than you would have done in the old days, or the careful custody of tools, it is all-important towards the object of conserving our resources.

YOU can start NOW to give very real and direct aid to our country by ensuring that in your job you make it a point of honour to waste nothing and use material in the most thrifty manner. It costs nothing, except thought and imagination, but the margin of economy I know you will achieve will form a notable contribution to the war efforts from the workers in every section of the L.M.S. I rely with confidence therefore, upon your response.

A. DAVIES,
Vice-President

Port of London Charges Increased

Charges at the Port of London have again been increased, and the present advance, the third, became effective on June 30. In three cases, namely, river duties on tonnage of vessels; dues, rates, and charges (including rent) on shipping; and rates and charges (including rent) for the use of dry docks and appliances; the former addition of 40 per cent. on pre-war rates is to be increased to 100 per cent. For the port rates on goods the former addition of 7½ per cent. on india rubber and 25 per cent. on other goods is increased to 100 per cent. The addition to canal tolls and charges, which was 12½ per cent., has been raised to 40 per cent., and this increase also applies to navigation toll of vessels carrying merchandise westward of London Bridge. In cases where rates and charges (including rent) on import goods were on a net basis, they have been increased by 27½ per cent., and, where they were subject to percentage increases, revised percentage advances have been made.

Maize as Railway Fuel in Argentina

A series of successful experiments in the use of a mixture of maize and coal as fuel in goods locomotives was recently carried out on the Central Argentine Railway under the supervision of the Director-General of Railways, the object being to ascertain how far this would assist the Argentine Government to dispose of the surplus crop, and at the same time ease the situation created for the railways by the shortage and high cost of coal. These tests demonstrated that maize could be used in a proportion varying between 60 per cent. maize and 40 per cent. coal, and 60 per cent. coal and 40 per cent. maize, according to running conditions. Nevertheless, despite the successful results obtained experimentally, there are definite limitations to the adoption of the practice.

Theoretically, maize is stated to possess a calorific value in the ratio of about 1 to 2.5, as compared with coal, but in practice it has been found that nothing like this equivalent is obtainable in a locomotive boiler. Moreover, maize contains in its theoretical heat value a high proportion of hydrogen which, in practice, escapes unburnt or only partly burnt through the chimney. The practical equivalent of maize to coal as locomotive fuel is, therefore, about six tons of maize to one of coal, and, in consequence, there is a great increase in the cost of handling, as compared with coal. Moreover, as the space occupied by maize is about 2½ times that of coal, the volume to be stacked, loaded on to tender, and passed through the firebox is 13½ times that of coal. Since this amount is beyond the tender capacity of any class of locomotive, trains using maize must make frequent stops for refuelling. If, in addition, the fuel has to be transported to important centres such as Mendoza or Tucuman, at considerable distances from the maize-growing zones, this method of firing is rendered impossible by the fact that the locomotives using it would be fully occupied in hauling their own fuel.

The number of coal-burning locomotives that can be used for maize fuel is, therefore, limited, and those designed for oil-burning are, of course, quite unsuited for the purpose, the latter restriction applying more particularly to such railways as the Buenos Ayres Great Southern, where a high proportion of the locomotives are oil-fired.

Experiment has shown that to give satisfactory firing results, maize must be mixed with coal in the proportion of 40 per cent. of the former and 60 per cent. of the latter. Thus a railway receiving, say, 6,000 tons of coal a month could consume only 4,000 tons of maize in the same period, even if all the coal were used for mixing.

Railways burning wood on some of their lines find it necessary to mix a certain proportion of coal with it for their more important trains. As more coal is required for mixing with maize than with wood, such railways could assist in consuming maize only if they received an extra supply of coal; a contribution to the solution of the surplus maize problem which would operate to the greater aggravation of the fuel shortage.

Actually, therefore, the extent to which the Argentine railways may be expected to utilise maize as fuel depends upon the amount of coal they are allowed. Moreover, its employment is limited to their goods services, as the sustained high speeds of the passenger services rule out the use of maize. Thus, the maximum maize consumption capacity of the four broad-gauge lines jointly is estimated at approximately 12,000 tons a month, a quantity too small to affect the surplus maize problem appreciably.

Despite the present high cost of coal and oil fuel, the value to the railways of maize as locomotive fuel, having regard to its inconvenient bulk, additional cost of handling and low calorific yield, is put at not more than \$5.00 per ton. Even at that figure its use generally would be far from economical, and on some lines it would be prohibitive.

Despite the unsuitability of maize for railway fuel, the Director-General of Argentine Railways, under instructions from the Ministry of Public Works, has circularised the railway companies urging upon them the necessity of using a mixture of 60 per cent. coal and 40 per cent. maize for locomotive fuel. The Director-General considers that the extra expense which the railway companies estimate the use of maize fuel would involve is too high, since it is based on the necessity for the frequent reloading of coal and on

the calorific yields of maize and coal, respectively, which do not agree with the results obtained in the official tests. Presumably, the Government's recommendation applies only to the use of maize in goods locomotives, as its employment in passenger locomotives is ruled out under normal running conditions, involving the maintenance of high speeds over long distances.

First C.P.R.-Built Tanks

On May 22 the first tank ever to be built in Canada was turned out of the Canadian Pacific Railway Angus workshops, Montreal, and formally handed over by Mr. D. C. Coleman, Vice-President, to Mr. C. D. Howe, Minister of Munitions & Supply. This tank, which is of the heavy infantry type, is the first of a large number to come off the Angus shops assembly line, where production is under the supervision of Mr. H. B. Bowen, Chief of Motive Power & Rolling Stock, and is proceeding night and day.

French Transit Limitations

An indication of the severe restrictions imposed by the German authorities on transit between occupied France and unoccupied (Vichy) France may be gained from the regulations applying to the distribution of French newspapers. The leading Vichy papers at the present time are the *Temps*, *Figaro*, *Journal*, *Action Francaise*, *Sept Jours*, and the original *Paris-Soir*, all of which are published at Lyons; the *Jour-Echo de Paris* and *Guingoire*, published at Marseilles; the *Petit Journal*, *Journal des Débats*, and *Candide*, published at Clermont-Ferrand; and the *Garonne* at Toulouse. None of these papers is allowed into occupied France. The principal papers published in Paris are *l'Illustration* and the *Pariser Zeitung*, and the German-controlled *Paris-Soir*. These and such other French-language Paris dailies as *l'Euvre* and *Nouveaux Temps* are prohibited from being transported into unoccupied France.

Rolling Stock in Belgium

According to information which has been published recently in the *Neue Zürcher Zeitung* and the *Brüsseler Zeitung*, some 50,000 railway trucks are now in use in Belgium; of the pre-war stock approximately 45,000 are said to have been taken out of the country by the Germans or destroyed during the course of hostilities. Of the 78,000 lorries that Belgium was said to have possessed before the German invasion, very few are now available for use, due partly to lack of fuel and partly to requisitioning.

Belgian Carriage and Wagon Building

According to a survey of economic conditions in Belgium which was published in Germany recently, the existence of a large railway carriage and wagon building industry in Belgium, with a pre-war annual output of 47,000 vehicles, has proved of very considerable value to the Reich. This review stated that there were no fewer than 60 works available in Belgium where railway wagons could be repaired, and that these were now employing 9,000 instead of the 7,000 immediately before the German invasion of Belgium. Intensive use of railway wagons was being practised, and arrangements were in force for expediting loading and unloading. An example was quoted of the carriage of wheat by rail from Northern France to Antwerp in railway wagons which were then sent empty to the Limburg mines, where they were loaded with coal and returned to occupied France.

Railway Operating Difficulties in Switzerland

The Swiss railways are putting up an excellent performance in coping with the greatly increased traffic resulting from (a) severe restrictions on road transport both for freight and passengers (since May almost entirely suspended), (b) military traffic, and (c) heavy international transit traffic, over the Gotthard and Lötschberg-Simplon routes. These factors have more than offset the complete cessation of foreign tourist movements, and the working of such abnormally heavy traffic has presented serious problems and laid a heavy strain on the railway personnel and equipment. Trains scheduled as "light" and nominally having limited accommodation, have been regularly running with the composition of ordinary expresses, and trains of 10 to 14 coaches have become a normal

practice on the main lines. The 1940-41 timetable provided for very short station stops, which soon proved wholly inadequate as traffic increased, resulting in very frequent delays and consequent unpunctuality. In the new timetable, which came into force on May 5, the schedules have been eased out to permit of longer station stops where necessary. The annual report recently issued indicates that since March, 1940, it has been necessary to use a number of steam engines on electrified lines, which ran 140,000 km. up to December 31; this however represented only 0.3 per cent. of the haulage on these lines. Further difficulties encountered by the railways were the very severe winters, during which lines were on several occasions blocked by avalanches for a few hours, and damage to tracks, buildings and rolling-stock through bombardment by foreign aircraft at Renens (June 11-12), Bales (December 16), and Zurich (December 22).

German Refrigerator Technique and Transport

Six Reich food offices (respectively for fat, meat, eggs, fish, grain, and garden produce) in conjunction with a number of private firms have founded a new company entitled *Kühl-dienst G.m.b.H.*, according to the *Deutsche Bergwerks-Zeitung* of May 29. The object of this company is to produce refrigerator machinery and cold storage equipment to be used for the transport of easily perishable foods by rail, road, or ship. The six Reich food offices have taken up the majority of the company's total share capital of RM.500,000. The *Frankfurter Zeitung* of May 28 says that the new undertaking is expected to speed up the use of refrigerator transport of foodstuffs between cold and warm regions and *vice versa*, and to co-operate closely with the German State Railway and with the *Deutsche Behälterverkehrs G.m.b.H.*

Commercial Relations between the U.S.A. and Germany and Italy

Since the spread of hostilities to most parts of Europe and the Near East, one of the principal means of contact between enemy countries and the outside world has been provided by the U.S.A. consulates in German- and Italian-occupied territory, and by German offices in the U.S.A. The American authorities, however, have felt for some time that German organisations in the U.S.A. were being used as a cloak for other activities and on June 16 President Roosevelt ordered the closing of all German consulates in the U.S.A. together with the railway and tourist bureaux, the German Library of Information in New York, and the German Trans-Ocean News Agency; the order requires all German nationals connected with them to be removed by July 10. The text of the Note from Mr. Sumner Welles to the German Government was as follows:—

"It has come to the knowledge of this Government that agencies of the German Reich in this country, including German consular establishments, have been engaged in activities wholly outside the scope of their legitimate duties. These activities have been of an improper and unwarranted character. They render the continued presence in the United States of those agencies and consular establishments inimical to the welfare of this country. I am directed by the President to request that the German Government remove from United States territory all German nationals in any wise connected with the German Library of Information in New York, the German railway and tourist agencies, and the Transocean News Service, and that each of these organisations and their affiliates shall be promptly closed. I am also directed to request that all German consular officers, agents, clerks, and employees thereof of German nationality shall be removed from American territory, and that consular establishments likewise be promptly closed. It is contemplated that all such withdrawals and closures shall be effected before July 10. Accept, sir, the renewed assurances of my consideration."

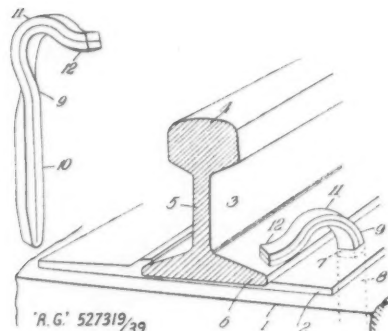
As a counter move the German authorities on June 19 issued an Order requiring the closure of U.S.A. consulates and offices of the American Express Company in Germany and German-occupied territory by July 15. The U.S.A. then brought Italian consulates within the scope of its ban, and Italy responded similarly. The German Railway Information Office in New York was closed on June 18.

ABSTRACTS OF RECENT PATENTS*

No. 527,319. Rail Fastening

Elastic Rail Spike Co. Ltd., of Cory Buildings, 117, Fenchurch Street, London, E.C.3, and Leopold Stewart Sanson, of 194, Grange Loan, Edinburgh, Scotland. (Application date: April 4, 1939.)

A fastening for a rail 3, having head 4, web 5 and flange 6, consists of a rail spike 9 having a shank 10, driven into a hole 8 in the sleeper 1, and a resilient gripping arm 11 with a straight end 12 engaging the flange 6, the gripping arm 11 projecting obliquely to the rail 3, bearing wholly on the flange 6 out of the vertical projection of the head 4, and pointing in the longitudinal direction opposite to that of the traffic on the rail. A tie or base plate 2 may be provided between the sleeper 1 and the flange 6 of the rail 3, this plate 2



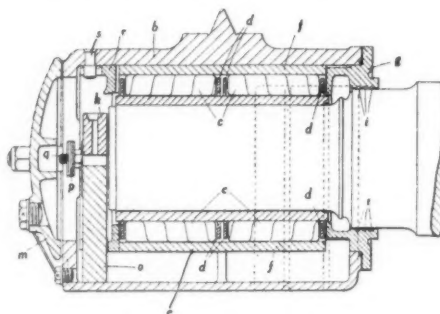
having a hole 7 in alignment with the hole 8 in the sleeper 1 to receive the shank 10 of the spike 9. Two sides of the holes 7 and 8 are parallel to and the other two sides are perpendicular to the rail 3, the spike 9 being twisted, as shown, to obtain the desired effect. In one modification the spike 9 is not twisted but the holes 7 and 8 are oblique to the rail 3.—(Accepted October 7, 1940.)

No. 527,329. Axle Bearing

Delco-Remy & Hyatt Limited and William Archibald Crewe, all of 111, Grosvenor Road, London, S.W.1 (Application date: April 6, 1939.)

A railway vehicle axle box has interturned flanges *j* forming an elongated aperture in the end of the housing *b*, and an end thrust plate *k* which can pass through this aperture and which when thereafter turned through an angle will abut against the inside surfaces of the flanges. The axle journal *a* is carried in the housing *b* by radial roller bearings *c* positioned by cages *d*

between an inner steel race *e*, secured to the journal *a*, and an outer race *f* secured in the housing *b*. An inner



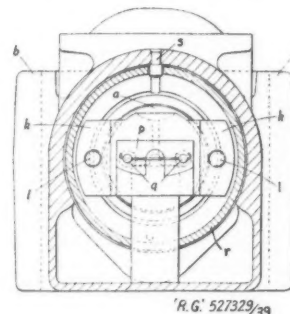
annular plate *g* held by bolts *h* serves to retain the outer race *f*, rollers *c* and cage *d*, and is provided with lubricant sealing grooves *i*. Bolts *l* hold the thrust plate *k* in position, and extensions of these bolts beyond their hexagonal heads position the end cover *m*. The cover *m* is held by retaining nuts *n*. A lubricating wick *o*, placed in a recess in the plate *k*, extends down into the bottom of the housing *b* and is held in a slot in a ring *r* by a dowel *s*. Shims *p* may be provided to take up wear of the thrust plate *k*. When not in use these shims may be mounted on a pair of studs *q* on the outer face of the thrust plate.—(Accepted October 7, 1940.)

No. 527,187. Electric Locomotives

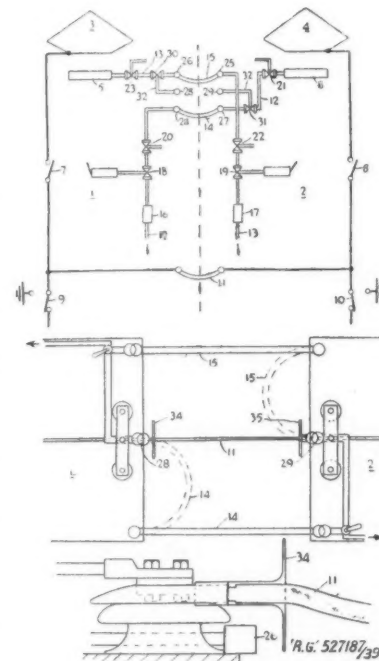
The General Electric Co. Ltd., of Magnet House, Kingsway, London, W.C.2, and Edward Hugh Croft and Norman Walter Robson, both of The General Electric Co. Ltd., Engineering Works, Witton, Birmingham. (Application date: April 9, 1939.)

An electric locomotive comprises two separable but normally coupled parts 1 and 2, each provided with one or more motors and a pantograph collector 3 or 4 arranged to contact an overhead supply wire. When the parts 1 and 2 are coupled pneumatic raising mechanism for each collector, comprising a cylinder 5 or 6 with a piston coupled with the collector 3 or 4, is supplied with compressed air from a supply on the other part. This is effected by compressors and supply pipes 12 or 13. Safety release cocks 20, 21 or 22, 23, which are interlocked with a door through which access may be had to the high tension equipment of each part, are adapted, on operation to lower the collectors 3 and 4. The collectors are normally coupled by a main power jumper 11 comprising a detach-

able flexible cable connected on the equipment sides of the isolators 7 and 8. When the jumper 11 is in position air cannot be supplied to the collector raising mechanism from the supply on the same part 1 or 2. Main earthing switches 9 and 10 are included. Be-



tween the two parts 1 and 2 the pipes 12 and 13 are formed by detachable flexible hose couplings 14 and 15. There is also a pantograph valve 16 or 17 and a three way cock 18 or 19 of normal construction for each part 1 or 2. The couplings 14 and 15 are not sufficiently long to connect the main supply points 24 or 25 with the points 26 or 27 connected with the pantograph cylinders, but are long enough to connect the points 24 or 25 with emergency supply points 28 or 29. Two-



way cocks 30, 31 control the main pipes 12 and 13 and the emergency pipes 32 and 33. Normally the emergency supply points 28, 29 are covered by fouling discs 34, 35 mounted on the jumper 11 such that emergency supply connections must be broken before replacing the jumper.—(Accepted October 3, 1940.)

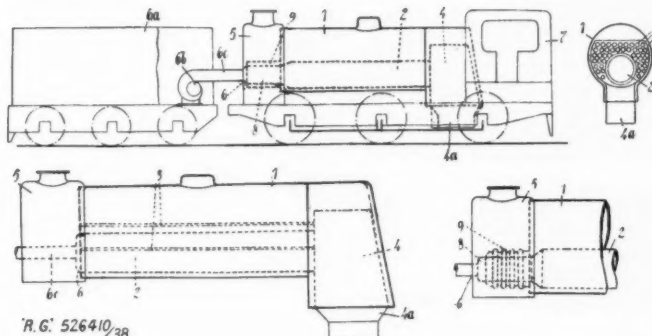
* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. Group abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued, on payment of a subscription of 5s. a group volume, or in bound volumes, price 2s. each, and the full specifications can be obtained from the same address price 1s. each.

No. 526,700. Steam Generators

Lovell Strange Eaton Ellis, of Mewburn, Ellis & Co., of 70 & 72, Chancery Lane, London, W.C.2. (A communication from abroad by Oil Wells Supply Company, of No. 2001, North Lamar Street, Dallas, Texas, United States of America.) (Application date: March 23, 1939.)

A steam generator 10 of the locomotive type comprises a firebox 11, a steam generating unit provided with fire tubes 13 of a length such as to provide discharge gases at a temperature of over 750° C., a smokebox 14, a superheater chamber 25 and a chimney or stack 17, the afore-mentioned units being in horizontal alignment and arranged so that gases of combustion from the firebox 11 pass through the steam generating unit into the smokebox 14, and from the bottom of the smokebox into the chamber 25. Gases of combustion are exhausted separately from the top of the smokebox 14 and the superheater chamber 25 into the stack 17, by means of baffle plates 28, 29 in the lower portion of chamber 25, and by means of exhaust flue 15 and damper 16. Steam is conducted from the generator 10 passes to the upper header 26 and then to the lower header 27 through a series of reverse bends 30 of pipes. Skids 18, 19 are secured below the generator barrel 12, and are spaced by a piece 20, the skids being upturned at 21. To prevent leakage the skids 18, 19 are secured by a rod 22

and one or more burners 6 for pulverised fuel, fed from tender 6a by a fan 6b and a duct 6c, and a slag and ash collecting and gas deflecting chamber 4. There is a single furnace 2 and there are return fire tubes 3. Chamber 4 has a hopper-like base 4a. The cab 7 may be at either end of the



'R.G.' 526410/38

boiler 1. The firing end of the boiler has a suitably shaped extension 8 which projects into or into and through the smoke box 5. This extension is surrounded by a casing 9 so as to form a water space communicating with the boiler water space. In operation burning fuel and air pass in a straight path from burner 6 through the furnace 2 to the chamber 4, the combustion products passing by the return tubes 3 to the smoke box 5. Ash and slag gather

527,166. Inglis, G. S. Means for handling transferable road-rail containers.

527,187. General Electric Co. Ltd., Croft, E. H., and Robson, N. W. Electric locomotives.

527,263. Gothaer Waggonfabrik Akt. Ges. Axle bearings for vehicles.

527,319. Elastic Rail Spike Co. Ltd. and Sanson, L. S. (Elastic Rail Spike

Corporation and Ruping, M. (in part)). Railway fastening means and spikes for use in connection therewith.

527,329. Delco-Remy & Hyatt Limited and Crewe, W. A. Railway and like axle bearings.

Railway and Other Reports**Ribble Motor Services Limited.**

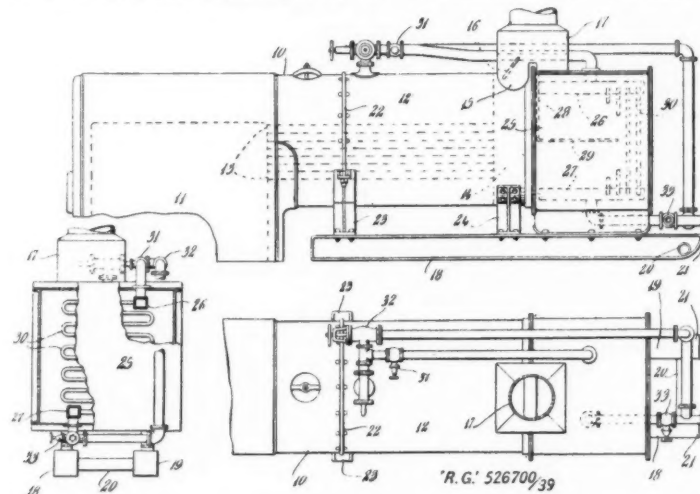
For the year ended March 31, 1941, this company, which is controlled by the L.M.S.R. and Tilling & British Automobile Traction Limited, secured a total revenue of £1,837,445 (£1,604,178). After deducting all expenses, including £200,000 (same) for depreciation and renewals and £276,978 (£40,000) provision for taxation, there remains a balance of £230,085 (£211,058), from which £75,000 has again been transferred to reserve, leaving £155,085, which, added to £46,892 brought forward, makes a total of £201,977, against £179,892. The preference dividend absorbs £13,000 and the dividend of 10 per cent. for the year on the ordinary shares takes £120,000, leaving £68,977 to be carried forward.

Contracts and Tenders

An order for 20 4-6-2 steam locomotives has been placed by the Canadian Pacific Railway Company with the Canadian Locomotive Co. Ltd., Kingston, Ontario. The approximate value of the order is understood to be \$2,400,000.

The Otis Elevator Company was recently awarded contracts for 38 escalators for various stations on the new Chicago City Subway which is now under construction and is due to be opened for service in 1942.

The London office of Sanderson Brothers & Newbould Limited is now Iddesleigh House, Caxton Street, S.W.1, Telephone, Whitehall 5632.



'R.G.' 526700/39

which is bolted to a cradle 23. The skids are riveted or bolted to smokebox 14 by brackets 24. Valves 31, 32, 33 control the passage of steam. The generator is mainly intended for use in drilling petroleum wells.—(Accepted September 24, 1940.)

No. 526,410. Locomotives

Symington Macdonald, M.C., B.Sc., of 90, Dalkeith Road, Edinburgh, Scotland. (Application date: December 16, 1938.)

A steam locomotive includes a return fire tube boiler 1 having a smoke box 5

in the hopper 4a of the chamber 4, from which they can readily be removed as convenient.—(Accepted September 18, 1940.)

COMPLETE SPECIFICATIONS ACCEPTED

526,824. Dell, R., Every, W. S., and London Passenger Transport Board. Time-controlled relays for railway signaling and the like.

526,930. General Railway Signal Company. Direct-current electric motors.

527,051. Associated Electric Vehicle Manufacturers Limited, and Jones, C. E. Trucks.

Questions in Parliament

Ownership of Railways

Sir Reginald Blair (Hendon—C.), on June 18, asked the Parliamentary Secretary to the Ministry of War Transport whether he would give an assurance that no Government scheme should be promulgated for any regrouping or alteration of ownership of the British railways before the Government had explained in detail to the country how those whose savings or corporate funds were invested in the railways might be affected and had obtained electoral assent for the changes contemplated.

Colonel Llewellyn: No special undertaking seems to be required about the particular class of property mentioned while the existing Parliamentary safeguards remain in force.

Sir R. Blair: Is it not a fact that there are about 850,000 different stockholders in addition to many thousands interested in insurance companies, building societies, banks, and trade, and in this democratic age ought they not to be consulted before any cut and dried scheme is produced?

Colonel Llewellyn replied that any scheme which was produced would have to have the sanction of the House.

First Class Compartments

Mr. J. Tinker (Leigh—Lab.), on June 18, asked the Parliamentary Secretary to the Ministry of War Transport if he would give consideration to removing the term third class passengers on railways and having one class only.

Colonel Llewellyn: In general the abolition of first class accommodation would diminish the convenience of railway travel without providing commensurate relief in other directions.

Mr. Tinker: Has not the time come when we should drop this class distinction?

Colonel Llewellyn said it was not really a case of any class distinction. A large number of people now using first class railway accommodation were on official business and did a great deal of work in their carriages, and for that reason he thought such a distinction was necessary.

Mr. A. Edwards (Middlesbrough East—Lab.): Is the Parliamentary Secretary aware that I recently travelled in a crowded train on which an official of his Department occupied a compartment to himself?

Colonel Llewellyn said that if Mr. Edwards would tell him the occasion, he would see that those compartments were not fully reserved in that way.

Mr. Edwards: I wrote a letter to the Parliamentary Secretary's Department a few weeks ago. The gentleman was Mr. Frank Pick.

Colonel Llewellyn: I do not think Mr. Edwards wrote to me.

Mr. Edwards: No, it was before your appointment.

Mr. Tinker gave notice that he would

raise the matter again, on the Adjournment at the earliest opportunity.

Railway Supplies

Mr. J. Summers (Northampton—C.), on June 18, asked the Parliamentary Secretary to the Ministry of War Transport, if he was satisfied that the pre-war practice of the railway companies in ordering supplies sold at a uniform delivered price, from sources which involved the longest carriage, had been abandoned.

Colonel Llewellyn: I am informed that this is not and never has been the practice of the railway companies.

Mr. Summers asked the Parliamentary Secretary if he was aware that it was common knowledge in trade circles that this was the case before the war.

Colonel Llewellyn replied that he was told that the practice was to buy goods at the lowest tendered price. Obviously, in peacetime that was the best practice, but he appreciated that the practice to which Mr. Summers referred ought to have been stopped.

Railway Workers' Wages

Mr. A. Creech Jones (Shipley—Lab.), on June 18, asked the Under Secretary of State for the Colonies whether steps had been taken by the Governor of the Gold Coast to meet the wage claim advanced by the railway employees; and whether concessions had been made, in view of the rising cost of living.

Mr. George Hall, in a written reply, stated: I understand that the question of raising the maximum of the salary scale for senior locomotive drivers is under consideration. As to concessions to the railwaymen on account of the rising cost of living, the position in this respect is being carefully watched by the Labour Department, but the Governor reports that so far neither the department nor the Provincial Wages Board have recommended the provision of a cost-of-living bonus.

Lineside Vegetable Growing

Lt.-Colonel Sir Thomas Moore (Ayr Burghs—C.), on June 19, asked the Minister of Agriculture whether he was satisfied that the maximum effort was being made to grow vegetables and animal feeding stuffs on suitable railway embankments, and other suitable railway property.

Mr. R. S. Hudson (Minister of Agriculture): Yes, Sir.

Railwaymen's Fire Service

Mr. W. Gallacher (West Fife—Communist), on June 19, asked the Parliamentary Secretary to the Ministry of War Transport whether motormen employed on the London underground railways were expected to undertake fire-watching duties during those weeks when they signed on for their railway duties at hours between 4.30 and 7.30 a.m., and were men who com-

pleted late duty during an air-raid expected to undertake fire-watching at the completion of such duty; and whether he would grant locomotive engineers and firemen, and electric train motormen, as well as guards, exemption from any schemes of compulsory fire-watching.

Colonel J. J. Llewellyn in reply wrote stating that he was making enquiries, and would communicate with Mr. Gallacher as soon as possible.

British and Irish Railway Stocks and Shares

Stocks	Highest 1940	Lowest 1940	Prices	
			June 26, 1941	Rise/ Fall
G.W.R.				
Cons. Ord.	52	22½	36½	+ 1
5% Con. Pref.	103½	58	100	+ ½
5% Red. Pref. (1950) ..	105½	88	103	—
4% Deb.	107½	90½	109½	— ½
4½% Deb.	108½	96½	113	—
4½% Deb.	114½	96	116½	—
5% Deb.	124	106	130	—
2½% Deb.	66½	57	66	—
5% R. Charge	117½	97	127½	—
5% Co. & Guar.	117	90½	124½	— ½
M.S.R.				
Ord.	24½	9	13½	—
4% Pref. (1923)	60½	21½	41½	+ ½
4% Pref.	70½	35	58½	+ 1½
5% Red. Pref. (1955) ..	94½	60	84½	—
4% Deb.	101½	81	100½	+ ½
5% Red. Deb. (1952) ..	109½	102	108	—
4% Guar.	93½	65	93½	— ½
L.N.E.R.				
5% Pref. Ord.	8½	1½	2½	—
Def. Ord.	4½	1½	1½	—
4% First Pref.	60	20	41½	+ ½
4% Second Pref.	22½	6½	15½	+ 1½
5% Red. Pref. (1955) ..	80	34½	62½	—
4% First Guar.	86½	56	84½	+ 1
4% Second Guar.	77½	37	70½	—
3% Deb.	73½	54½	74½	— ½
4% Deb.	97½	74	100½	—
5% Red. Deb. (1947) ..	107	96½	104	—
4½% Sinking Fund Red. Deb.	104	98	102½	—
SOUTHERN				
Pref. Ord.	79	34	54	+ 1½
Def. Ord.	22½	7	12	—
5% Pref.	104½	58½	95½	+ 1
5% Red. Pref. (1964) ..	105	85	100½	—
5% Guar. Pref.	116½	90	124½	— ½
5% Red. Guar. Pref. (1957)	114½	94	113½	—
4% Deb.	106½	84½	106½	— ½
5% Deb.	122½	100	128½	—
4% Red. Deb. (1962- 67)	106	96½	106	—
4% Red. Deb. (1970- 80)	106½	93	106	—
FORTH BRIDGE				
4% Deb.	95½	87	92½	—
4% Guar.	93½	81½	90½	—
L.P.T.B.				
4½% "A"	116	103	114½	— ½
5% "A"	121½	107	123½	— ½
4½% "T.F.A."	105½	101	101½	—
5% "B"	116	102	109½	— ½
"C"	65½	24	36½	+ 2½
MERSEY				
Ord.	26	18½	20½	—
4% Perp. Deb.	92½	86½	92½	—
3% Perp. Deb.	68	63	67½	—
3% Perp. Pref.	57	50½	53½	—
IRELAND BELFAST & C.D.				
Ord.	4	3	4	—
G. NORTHERN				
Ord.	4½	1½	8½	—
G. SOUTHERN				
Ord.	12½	4	8½	—
Pref.	15½	6	9½	—
Guar.	36	15	28	— ½
Deb.	55½	40	52	+ 1½

OFFICIAL NOTICES

Bombay, Baroda and Central India
Railway Company

NOTICE is hereby given that the One hundred and fifty-fourth General Meeting of the Bombay, Baroda and Central India Railway Company will be held at the temporary offices of the Company, "Guildcroft," Epsom Road, Guildford, on Monday, the 14th July, at 12 noon precisely:

- (1) To receive the Directors' Report and Accounts.
- (2) To declare a dividend.
- (3) To transact the General Business of the Company.

Warrants for the guaranteed interest and dividend will be forwarded on the 14th day of July to Stock-

holders registered in the Company's Books on the 18th day of June, 1941.

By Order,

N. LINCOLN,

Secretary.

N.B.—A copy of the Directors' Report and Accounts can be obtained by any Stockholder on application to the Secretary.

Offices: The White Mansion,
91, Petty France,
Westminster, S.W.1.

Temporary Offices: "Guildcroft,"
Epsom Road,
Guildford,
24th June, 1941.

APPLICATIONS are invited from CIVIL ENGINEERS for the post of MAINTENANCE ENGINEER in the Government of British Guiana Transport and Harbours Department. Engagement for three years. Salary £600 a year. Free passages and for wife and children not exceeding four persons. Candidates must be fully qualified Civil Engineers and have had good training in track maintenance, embracing yards layout and laying down of points and crossings.

Write, stating age and full particulars of qualifications and experience, to the Crown Agents for the Colonies, 4, Millbank, London, S.W.1, quoting M/8393.

Notes and News

Canadian National Railways.—Gross earnings during May last were \$26,725,770, an increase of \$6,444,435, and operating expenses were \$18,936,929 an advance of \$2,167,528, leaving net earnings \$4,276,907 higher, at \$7,788,841. Aggregate gross earnings from January 1 are \$116,073,136, an increase of \$24,751,522, and the net earnings of \$25,279,769 show an improvement of \$14,640,893.

Road Accidents in May.—The Director-General of War Transport states that the number of persons reported to have died in Great Britain during the month of May, 1941, as a result of road accidents was 701, which compares with 449 in the corresponding month last year. There were 150 (against 130) fatal accidents during hours of darkness and 551 (against 319) at other times. Adult pedestrians suffered most casualties, the number in May being 168 compared with 150 in May, 1940.

Railway Convalescent Homes.—The income and expenditure account of the Railway Convalescent Homes for the year ended December 31, 1940, shows that total income amounted to £54,860, and total expenditure, including depreciation, to £37,130, leaving a balance of £17,730. Of the income, railway staff collections provided £40,959, donations from the public, etc., £803, income from investments £3,026, hospital services £9,289, and sundries £782. Expenditure on maintenance absorbed £31,397, and on administration £4,309. The market value of investments at December 31, 1940, is computed at £97,132.

Increase of Exceptional Rates and Charges in Eire.—The Great Southern Railways Company has issued a statutory notice dated June 3 of a proposed increase of 5 per cent. in exceptional rates and charges for merchandise (including livestock) both by merchandise and passenger train service. The G.S.R. published rail receipts for 21 weeks of 1941 show an increase of £224,632 over the corresponding period of 1940, but it is understood that the operating costs also show a considerable increase over those of last year, hence the necessity for further increase in rates. The company contemplated an even greater increase than 5 per cent., but it was eventually decided that this

figure, while affording some relief to the company, would not inflict a hardship on trade generally. The proposed increase takes effect on the expiration of 30 days from date of the notice.

Great Southern Railways (Eire).—For the 23rd week of 1941 the Great Southern Railways Company reports passenger receipts of £41,456 (against £34,693), and goods receipts of £47,618 (against £41,920), making a total of £89,074 (against £76,613) for the corresponding period of the previous year. The aggregate receipts to date are passenger, £834,296 (against £712,605); goods £1,149,570 (against £1,025,156); making a total of £1,983,866 (against £1,737,761).

Staff and Labour Matters

A.E.U. Annual Conference

The annual conference of the Amalgamated Engineering Union was held this year at Llandudno and was opened on Monday, June 16, by Mr. Jack Tanner, President of the union. Among the subjects dealt with by the conference were:—

FIRE WATCHING

A resolution "viewing with alarm" the fire prevention regulations issued by the Home Secretary, which, it was stated, abrogated the principle of payment for work done, was put forward by the London branches. The motion, which was carried, instructed the executive to inform the Government that the regulations would be unacceptable unless payment for work done was assured in accordance with the overtime and night shift agreement of the union.

SCHEDULE OF RESERVED OCCUPATIONS

The conference carried a resolution requesting that in regard to the schedule of reserved occupations there should be consultations with the appropriate trade unions before revisions were made.

WAGES

A resolution, which was adopted, recorded disgust at the inadequate award of the National Arbitration Tribunal which gave the Engineers an advance of 3s. 6d. a week, and the conference decided to make a fresh application forthwith for an advance of 4d. an hour on the present basic rates. It was also decided to go forward for

an improvement in the scale of pay for apprentices, boys, and youths.

FEMALE LABOUR

Concern about women in the workshops was expressed. Although the Amalgamated Engineering Union does not admit women into membership, it was decided that it should with other unions concerned open negotiations to reduce the qualifying period women serve in the workshops and definitely establish the principle of equal pay for equal work.

Dock Labour

The sixteenth report of the Select Committee on National Expenditure, which was published on June 21, contains recommendations and suggestions for the better control of dock labour and the speeding up of transport. Its sub-committee on the transport services since March has visited certain ports and investigated operations on the spot.

The sub-committee states that considerable improvements have followed the appointment of regional port directors at certain of the ports. The introduction of new methods is undoubtedly resulting in closer co-operation and improved efficiency. Having made careful inquiries into the probable results of the introduction of the new schemes, the sub-committee reported:—

"It may be argued that these new schemes are more expensive in operation than the old casual system. Given, however, certain conditions, the higher cost may be offset by the greater mobility and efficiency of dock labour. The attainment of this desired result must entail adequate supervision of the men and the taking of disciplinary action in all cases of unjustifiable absenteeism, bad time-keeping, refusal to accept work or deliberate avoidance of work offered." The sub-committee recommended that every effort should be made to extend piece rates wherever practicable.

The sub-committee also recommended that small committees should be set up by the Minister of War Transport at the more important ports to inquire into and report upon the working of the new schemes as soon as they had been in operation for three months, and that until this investigation had been made similar schemes should not be introduced at other ports.

Railway Stock Market

Although there was little broadening of demand, a very firm undertone has developed in most sections of the Stock Exchange, where sentiment was governed by the further rise in British Funds. Absence of selling was again an important market factor, and owing to the firmness with which most classes of securities are held, many stocks and shares remained in very short supply. Home railway prior charges, however, were only moderately responsive to the further rise in gilt-edged, despite general recognition of the attractive yields. In fact, main attention again centred on the junior and kindred securities in view of general anticipations that the interim dividend decisions, expected on July 25, will be the same as a year ago. The statement of revenue and expenses, which will be issued at the same time, is naturally being awaited with considerable interest, because it should enable the position to be assessed somewhat more clearly. It is, in fact, now being suggested that increased traffic may have offset the big expansion in wages and other costs to a larger extent than is regarded as possible in most quarters. It should, however, be borne in mind that the future depends on the revision of the financial agreement, made imperative by advancing costs and the question of war

damage insurance. Bearing in mind that earnings must now be running well in excess of the "standard revenues" of the 1921 Act, there is continued confidence that the railways will be treated in an equitable manner, and that dividends on the junior stocks are likely to be in excess of the rates that could be paid on the basis of the minimum guaranteed revenue under the financial agreement of last year. If this proved the case there would, of course, be scope for substantial improvement in market values of the junior issues. The low levels of the latter reflect doubts whether any early decision will be possible in regard to railway war-time finance, and also the fact that on so many occasions in the past the reasonable hopes of stockholders have not been realised—although there is now, of course, general realisation of the vital part played by the railways. It will be recalled that on the payments that are possible on the guaranteed minimum revenue basis, namely, 3.3 per cent. on Great Western ordinary, 1 per cent. on L.M.S.R. ordinary, 1.2 per cent. on L.N.E.R. second preference, 0.8 per cent. on Southern deferred, and 1.5 per cent. on London Transport "C," yields at current prices would be quite attractive in most cases. The view prevails, however, that the current year's dividends are likely to equal those for 1940, i.e., 4 per cent. on

Great Western ordinary, 1½ per cent. on L.M.S.R. ordinary, 2 per cent. on L.N.E.R. second preference, 1½ per cent. on Southern deferred and 3 per cent. on Transport "C."

As compared with a week ago, Great Western ordinary has further improved from 35½ to 37 at the time of writing, and the preference stock transferred around par. L.M.S.R. ordinary was better at 13½, while the senior preference was 1½ points higher at 59, and the 1923 preference showed a rise to 42. Southern deferred was 12½; the preferred moved up from 52½ to 54½. More attention was given to L.N.E.R. second guaranteed, which rose from 72½ to 74; the first guaranteed was 85, compared with 84 a week ago. Moreover, L.N.E.R. first preference was better at 42, while there was a good deal of speculative interest in the second preference, which improved from 14½ to 15½. Wider recognition of the good yield drew further attention to London Transport "C," which appreciated from 34 to 37.

Among foreign railway stocks, better demand was reported for debentures and other securities of the leading Argentine companies, and slightly improved prices have ruled. Elsewhere, Leopoldina debentures again attracted a fair amount of attention. Canadian Pacific issues were firmer.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1940-41	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffic to Date			Shares or Stock	Prices			
			Total this year	Inc. or Dec. compared with 1940		Totals		Increase or Decrease		Highest 1940	Lowest 1940	June 26, 1941	Yield % (See Note)
						This Year	Last Year						
South & Central America													
Antofagasta (Chili) & Bolivia	834	22.6.41	£ 17,540	+ £ 30	25	£ 444,030	£ 469,900	- £ 25,870	Ord. Stk.	11½	3½	4½	Nil
Argentine North Eastern ...	753	21.6.41	ps. 205,000	+ ps. 46,900	51	ps. 7,419,800	ps. 7,946,700	- ps. 526,900	"	3½	1	2	Nil
Bolivar ...	174	May 1941	4,200	+ 210	22	19,132	20,650	- 1,518	6 p.c. Deb.	6½	5	6½	Nil
Brazil ...	...	...	...	...	...	...	...	...	Bonds	8½	5	5	Nil
Buenos Ayres & Pacific	2,801	14.6.41	ps. 1,535,000	+ ps. 480,000	50	ps. 72,038,000	ps. 69,064,000	+ ps. 2,974,000	Ord. Stk.	4½	1	2	Nil
Buenos Aires Central	190	18.1.41	£ 70,400	- £ 20,200	29	£ 2,477,400	£ 2,994,900	- £ 517,500	"	8½	2	3½	Nil
Buenos Ayres Great Southern	5,082	14.6.41	ps. 2,073,000	+ ps. 209,000	50	ps. 111,259,000	ps. 116,385,000	- ps. 5,126,000	Ord. Stk.	10½	3	4½	Nil
Buenos Ayres Western	1,930	14.6.41	ps. 958,000	+ ps. 232,000	50	ps. 39,697,000	ps. 39,236,000	+ ps. 461,000	"	8½	2	3½	Nil
Central Argentine ...	3,700	21.6.41	ps. 1,774,750	+ ps. 400,750	51	ps. 84,065,900	ps. 89,081,000	- ps. 5,015,100	"	8½	2	3½	Nil
Do ...	...	...	...	...	...	...	...	...	Dfd.	4	1	1	Nil
Cent. Uruguay of M. Video	972	14.6.41	29,584	+ 7,367	50	1,178,162	1,094,508	+ 83,654	Ord. Stk.	3½	1½	1½	Nil
Costa Rica ...	188	April 1941	15,450	+ 2,390	43	152,170	176,057	- 23,887	Stk.	23½	14	15½	12½
Dorada ...	70	May 1941	12,900	+ 100	22	62,100	59,100	+ 3,000	1 Mt. Db	99	97½	98	6½
Entre Rios ...	808	21.6.41	ps. 262,300	+ ps. 28,600	51	ps. 10,897,600	ps. 12,192,300	- ps. 1,294,700	Ord. Stk.	4	1½	1½	Nil
Great Western of Brazil	1,016	21.6.41	6,900	+ 1,700	25	235,900	271,700	- 35,800	Ord. Sh.	4½	1½	1½	Nil
International of Cl. Amer.	794	Mar. 1941	\$487,887	- \$103,925	12	\$1,444,383	\$1,762,134	- \$317,751	"	4½	1½	1½	Nil
Interoceanic of Mexico	...	May, 1941	5,235	+ 1,425	22	30,145	34,675	- 4,530	1st Pref.	9d.	9d.	1	Nil
La Guaira & Caracas...	1,918	14.6.41	25,550	+ 5,545	24	563,606	514,358	+ 49,248	Ord. Stk.	2½	4	4	Nil
Leopoldina ...	483	21.6.41	ps. 302,300	+ ps. 16,600	25	ps. 7,647,500	ps. 7,496,000	+ ps. 151,500	"	2/11½	1½	1½	Nil
Mexican ...	319	April 1941	11,861	+ 851	43	119,846	107,251	+ 12,595	"	2/11½	1½	1½	Nil
Nitrate ...	386	15.6.41	4,051	+ 1,650	24	47,008	80,815	- 33,807	Ord. Sh.	2½	1½	2½	5½
Paraguay Central	274	21.6.41	\$3,452,000	+ \$287,000	51	\$169,438,000	\$163,974,000	+ \$5,464,000	Pr. Li. Stk.	41	36	30½	19½
Peruvian Corporation	1,059	May, 1941	63,038	+ 6,669	48	709,504	750,190	- 40,686	Pref.	4	1	2	Nil
Salvador ...	100	19.4.41	411,999	+ 10,834	42	667,103	854,934	- 187,831	"	50	23	25	8
San Paulo ...	153½	15.6.41	43,125	+ 1,716	24	883,139	867,876	+ 15,263	Ord. Stk.	15/11½	11½	11½	Nil
United of Havana	1,346	21.6.41	23,160	+ 2,209	51	1,233,781	1,246,019	- 12,238	Ord. Stk.	11	11	11	Nil
Uruguay Northern ...	73	April 1941	1,009	+ 239	43	11,317	11,242	+ 75	"	11	11	11	Nil
Canada													
Canadian National ...	23,633	21.6.41	1,201,715	+ 189,005	25	26,774,475	21,426,282	+ 5,348,193	Perp. Dbs.	86	68	92	4½
Canadian Northern	...	...	...	...	...	...	...	...	4 p.c.	105½	95½	101½	3½
Grand Trunk	...	...	...	...	...	...	...	...	Ord. Stk.	9½	4½	8½	Nil
Canadian Pacific	17,153	14.6.41	855,000	+ 222,400	24	17,945,400	13,445,200	+ 4,500,200	"	99½	71	100	3
India													
Assam Bengal...	1,329	10.4.41	8,632*	+ 5,595	2	8,632*	3,037	+ 5,595	Ord. Stk.	99½	71	100	3
Barsi Light	202	31.5.41	270,525	+ 37,232	9	544,425	595,649	- 51,224	Ord. Stk.	283	234	301	5½
Bengal & North Western	2,086	Sept. 1940	14,625	+ 508	46	78,405	66,243	+ 12,162	"	96	83½	100½	4
Bengal Doonars & Extension	161	31.3.41	266,175	+ 11,055	52	8,989,306	8,266,447	+ 722,859	"	108	99	108	5½
Bengal-Nagpur	3,269	20.6.41	300,450	+ 31,575	12	2,532,000	2,436,300	+ 95,700	"	104	97½	104½	7½
Bombay, Baroda & Cl. India	2,986	10.4.41	206,475	+ 16,779	2	206,475	189,696	+ 16,779	"	284	238	293	5½
Madras & Southern Mahratta	2,939	31.5.41	66,150	+ 3,960	9	128,925	139,568	- 10,643	"	93½	83	97½	4½
Rohilkund & Kumaon	571	10.4.41	141,529	+ 23,547	2	141,529	117,981	+ 23,547	"	...	...	...	...
South Indian	2,500	10.4.41	...	...	...	...	...	...	...	...	...	...	...
Various													
Beira ...	204	April 1941	65,450	+ 1,362	2	495,141	5,255	+ 1,362	Prf. Sh.	7/10½	1	1	Nil
Egyptian Delta	610	10.4.41	6,617	+ 1,362	2	6,617	...	...	B. Deb.	53	44½	45½	7½
Kenya & Uganda	1,625	...	...	...	...	...	...	...	Inc. Deb.	88	80	87½	6½
Manila	...	...	...	...	...	...	...	...	...	...	...	...	...
Midland of W. Australia	277	Feb. 1941	13,851	+ 1,637	35	119,604	102,871	+ 16,733	"	...	...	...	...
Nigerian	1,900	31.3.41	102,291	+ 53,333	52	2,494,207	2,108,696	+ 385,521	"	...	...	...	...
Rhodesia	2,442	April 1941	429,209	+ 104,900	31	3,283,108	3,761,611	- 478,503	"	...	...	...	...
South Africa	13,287	10.5.41	723,137	+ 1,583	35	4,137,719	...	...	"	...	...	...	...
Victoria	4,774	Feb. 1941	870,683	...	...	...	...	...	"	...	...	...	...

Note. Yields are based on the approximate current prices and are within a fraction of ½. Argentine traffic is given in pesos.
* Chaitre Fair. † Receipts are calculated @ 1s. 6d. to the rupee